A study of the pricing decision of new issues in Hong Kong 1970-1974.

Cham, Kim Y. S.

Award date:
1978

Awarding institution:
University of Bath

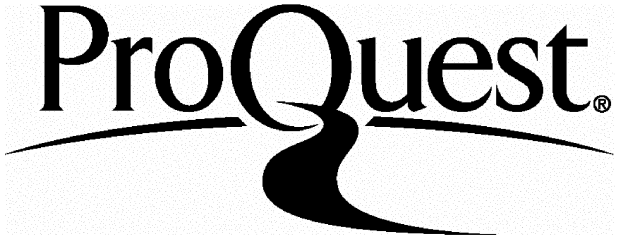
A STUDY OF THE PRICING DECISION OF NEW ISSUES IN HONG KONG 1970 - 1974

submitted by

KIM Y.S. CHAM

for the degree of Ph.D.
of the University of Bath

1978



ABSTRACT

This study represents a new approach to the pricing decision of new issues. The past studies reveal two notable inadequacies, namely, the lack of prediction power and the failure to recognize the behavioral differences between individual issuing houses. Focusing on the market discount, Merrett, Howe and Newbould proposed the use of the tender method when pricing a new issue, thus avoiding the need for price prediction. Davis and Yeoman attempted to relate the market discounts to market conditions and financial ratios of the issuing company. The resulting low explanatory power precludes the application of the model to pricing decisions. Furthermore the use of only one model assumes an uniform pricing behaviour for all issuing houses; it is thus incapable of identifying individual pricing differences. In testing the market discounts of two issuing houses in the United States, McDonald and Fisher though recognizing the difference in their pricing behaviour, made no attempt to identify the variables leading to the pricing difference.

The present study examines the actual pricing process of new issues during 1970 - 1974, taking into account individual behavioral differences. Pricing models have been constructed for nine issuing houses, of which six can be accepted

unequivocally while the remaining three can be accepted with some qualifications. The results of the pricing models in terms of R^2 are 0.55 for Wardley, 0.74 for Jardine Fleming, 0.79 for Schroders and Chartered, 0.69 for Hang Seng Bank, 0.81 for Oriental Financial Consultants, 0.94 for Union Bank, 0.92 for Hang Lung Bank, 0.67 for Overseas Trust Bank, and 0.50 for Bangkok Bank. All of them prove to have good predicting powers, even though the period of study included several volatile market conditions. In addition, individual pricing models were constructed for the four stock exchanges of the Hong Kong market, which yield satisfactory results. The R^2 tests give 0.53 for Far East Exchange,0.48 for Kam Ngan Stock Exchange, 0.52 for Hong Kong Stock Exchange, and 0.53 for Kowloon Stock Exchange. All in all, the models constructed in this study have demonstrated good explanatory and predicting power.

In the Appendix, a supplementary approach has been used to construct models with a broad sample base but covering some unusual market conditions. The results obtained by using this approach, reveal that the approach adopted for this study is decidedly preferable in nine out of thirteen cases.

ACKNOWLEDGEMENTS

I wish to acknowledge my appreciation to Professor C.R. Tomkins and Mr. P.J. Hutchinson who have supervised and guided me throughout this study. Their comments and suggestions were invaluable in the preparation of this thesis. I am also grateful to Professor R. Hsia for his constant advice and guidance.

In developing this study, I have interviewed many financiers on the operation of the stock exchanges and the new issue market. I must record my appreciation to Mr. T. Cann, Philips & Drew, Mr. J.W. Howarth, Cazenove & Co., Mr. C.Rance, Samuel Montague & Co. and Mr. C.Roshier of Hill Samuel & Co. They have assisted in broadening my knowledge of the securities industry in the City of London. I am indebted to Mr. R.F.S. Li and Mr. K.P. Chau, Far East Exchange, Mr. P.F. Chan, Kowloon Stock Exchange, Mr. R. Witts, Hong Kong Stock Exchange, Mr. M.K.F. Lam, Kam Ngan Stock Exchange, Mr. W.F.W. Bischoff, Schroders and Chartered Limited, Mr. A. Smith, Jardine Fleming Limited, Mr. I.D. Dawson, Wardley Limited, Mr. S.S.K. Kwan, Hang Seng Bank Limited, Mr. K.S. Lee, Union Bank of Hong Kong, Mr. W.C. Poon, Poon & Co., Mr. M. Cheung, Peat, Marwick, Mitchell & Co., Limited, Mr. Y.K. Au Yeung, Y.F. Au Yeung & Co., Mr. F. Ka, Richardson Securities of Canada (Pacific) Limited, Mr. J. Sun, Goodyear Estates Limited, Mr. Lau Chi-Man, Kar Yau Company Limited. They have all enlightened me with their expertise in the different aspects of the market.

A very special acknowledgement is due to Mr. J.B. Selwyn, former Commissioner for Securities, who has not only assisted me during his office but has continued to suggest amendments to drafts of this thesis by mail after his retirement in England. I wish to thank Miss S. Selwyn who has assisted me in making the necessary connections. It is also my pleasure to express particular gratitude to Mr. D. Ashton, Mr. J. Harris, and Mr. R.K.C. Li who have kindly offered comments on the statistical treatment of the study.

Finally, my sincere appreciation goes to Dr.the Hon.R.L. Huang, Vice-Chancellor of the University of Hong Kong and Mr.N.J. Gillanders, Secretary of the University for their encouragement.

January 1978, Bath

Kim Y.S. Cham

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CHAPTER I

INTRODUCTION

Purpose of Study

During the period 1970 - 1974, 220 local companies were floated on the Hong Kong Stock Exchanges. With these flotations, the market prices of practically all new issues after the commencement of trading were significantly different from their offered prices, giving rise to market discounts of considerable magnitude. In London, such discounts have been used as a measure of the efficiency of underwriting.[1] Some studies[2] were conducted attempting to explain this price variance, but it was found difficult to explain. This was due to the presence of the random factor of uncertainty affecting the market price after trading commenced. Hence, the instability of the sample universe has reduced the explanatory power of these studies.

On the other hand, it must be recognized that issuing houses do possess certain skills and sophistication, and in pricing a new listing, the issuing house should have applied certain consistent processes of evaluation. Furthermore, in Hong Kong, an issuing house also acts as the underwriter of an issue. It then assumes a

(See two thoroughs pages hence)

1 Merrett, op.cit. p.205.

2 Details of these studies are given in the following section.

This concentration has undoubtedly been due to established reputations and perhaps different pricing techniques. As Bischoff[1] pointed out, "The business of a merchant bank is built on goodwill, a guarantee for integrity and a display of ingenuity, all of which are essential prerequisites." While reputation is an intangible which cannot be improved overnight, it is important to improve pricing techniques of the less sophisticated underwriters via the introduction of a management tool.

It is, therefore, the objective of this study to examine the pricing process and identify the decision variable which are used. For the less sophisticated issuing houses, this could be a management tool worthy of consideration. To some extent, less efficient houses will be able to improve their pricing methods, or to recognize their internal constraints, be they financial or managerial. This will not only provide an insight into mysteries of underwriting, but also improve the overall performance of merchant bankers leading to the improvement of efficiency in the Hong Kong capital market.

A total of 220 companies - which is a comprehensive study in the period 1970-1974, are included in the analysis.

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1 Bischoff, W.F.W. Merchant Banking - The Concept Matures, Far Eastern Economic Review, April 1, 1972, p.68.

(continue from page 1)

financial risk in underwriting as well as staking its reputation on the issue.[1] While the financial risk may involve a monetary loss in the short run, the intangible loss of reputation may be very costly in the long run. Thus, it is logical to hypothesize that issuing houses do go through a thorough and vigorous pricing process before determining the price of a new issue.

Hong Kong has witnessed different market conditions between 1970 - 1974, with the Hang Seng Index rising above 1,700 and subsequently falling to a low of 150. In a way, this can be attributed to the influx of uneducated and emotional investors. Amidst this degree of market volatility, it will be interesting to observe the behaviour of issuing houses in pricing a new listing. A pricing model, constructed on data in different market states, will be meaningful.

During this period under study, underwriting was concentrated in the hands of 4 merchant bankers whose market share by value are shown in Table 1.1.

TABLE 1.1 Market Share of Major Underwriters 1970-1974

Wardley	33.64%
Jardine Fleming	11.42%
Schroders & Chartered	7.40%
Hang Seng Bank	7.10%
Others*	40.44%
	100.00%

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1 Beech, J.W., Public Financing for Small Companies, The Canadian Chartered Accountant, Vol. 85, No.6, December, 1964.

* With individual issuing houses ranging from 0.03% to 3.63% in market share. The total number of underwriters is 53.

Appraisal of Previous Studies

Empirical research in the field of new issue pricing has been concentrated on measuring issuing house performance by the comparison of the market discount emerging after the price-fixing and the initial trading of the issue. Notably, studies on the U.K. market have been conducted by Merrett, Howe and Newbould,[1] Davis and Yeomans;[2] and on the U.S. market by McDonald and Fisher,[3] and Logue and Lindvall.[4]

Merrett, Howe and Newbould examined new listings on the London Stock Exchange between 1959 and 1963. Upon their finding that the issue price of fixed-price issues has been considerably below the subsequent market price, the concept of market discount was introduced as a cost of issue. Through regression analysis, they discovered a strong positive relationship between market discounts on offers for sale and movements in the general market index. They concluded that the issuing houses tend to take inadequate account of the general share price movement in determining the price for ~~few~~ new issues. Using the mean and variance of the market discount, Merrett, Howe and Newbould evaluated individual financial advisors' efficiency based on their ability to minimize market discounts.[5]

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1 Merrett, A.J., Howe,M., Newbould, G.D., Equity Issues and the London Capital Market, London, Longmans, 1967.

2 Davis, E.W. & Yeomans, K.A., Company Finance and the Capital Market, Department of Applied Economics Occasional Paper 39, University of Cambridge, 1974.
Also Observations on Equity Price Discounts in the London New Issue Market, The University of Aston, 1975.

3 McDonald, J.G. & Fisher, A.K., New-Issue Stock Price Behavior, Journal of Finance, March 1972.

4 Logue, D.E. & Lindvall, J.R., The Behavior of Investment Bankers: An Econometric Investigation, Journal of Finance,March 1974.

5 Merrett, op.cit. p. 174 & p. 211-2.

Newbould[1], using the same data, attempted to relate some quantifiable variables to the market discount and achieved low explanatory percentage. He proceeded on to examine qualitative forecasts by the Financial Times, as an independent source of prediction, and obtained better performance than the issue price.

Davis and Yeomans, using a sample of 275 new issues from April 1965 to March 1971, revealed the continuing existence of market discounts. While equity pricing for placements were less precise in bull markets, their main criticism is that in adverse market conditions, advice to smaller firms was not good. They considered that attention should be focused on the market behaviour to reduce the level of discount.[2]

McDonald and Fisher tested 142 new issues offered in the U.S. in the first quarter of 1969 and discovered that significant market discounts also existed. On examining the magnitude of the mean first week return of issues by two issuing houses, McDonald and Fisher inferred that the significant difference may imply a difference in pricing behaviour between the two.[3]

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1 Newbould, G.D., On the Prediction of New Issue Prices, Journal of Economics Studies, summer, 1966.

2 Davis, E.W. & Yeomans, K.A., Observations on Equity Price Discounts in the London New Issue Market, op.cit. p.23.

3 McDonald, op.cit. p.102.

Logue and Lindvall developed a simultaneous system of equations to examine the relationship between the issue price set by the investment banker and the cash spread charged by him as risk bearing compensation depending on different firms, issue characteristics and market conditions. They concluded that in pricing new issues, there is a significant difference between the price set and the cash spread charged. One of the explanations was that this might be caused by institutional restrictions on the behavior of investment banks, such as the regulations[1] imposed by the Securities Exchange Commission.

In short, past studies have been centred on the following issues:-

(1) The identification of the market discount.

(2) The use of its magnitude to evaluate performance of underwriters.

(3) The search for variables to account for the discount.

However, these studies may be subjected to two deficiencies. Firstly, the measure used in comparing efficiency is unstable. Secondly, there is no indication to explain the differences in pricing behaviour among different issuing houses except items of implied inefficiencies which can presumably be corrected.

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1 Logue, op.cit., p.214.

The measure of the discount[1] is given by :-

$D = P_m - P_i$; where P_m is the initial market price,
P_i, the issue price,
D, the absolute market discount.

Thus, the magnitude of D or D' is dependent on both P_m and P_i. While P_i is within the control of the issuing house, P_m is subjected to market forces. The market price, P_m, is in itself unstable and when this unstable value is applied to evaluate individual financial advisors, distortions of the data input will lead to inconsistent rankings. The instability is largely due to imperfections of the market place. Market expectations, risk profiles and market information are the more apparent elements of dynamics affecting the outcome of the market price. In the past two decades, many attempts have been made to construct

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1 Davis, E.W. & Yeomans, K.A., Company Finance and the Capital Market, op.cit., p.25.

This discount can be expressed as a comparative discount which is a percentage of issue price after adjusting for index charges.

$$D' = \left(\frac{P_m}{P_i} \times \frac{I_i}{I_m} \right) - 1 \times 100\%$$

where I_i is the market index at price-setting,
I_m the market index at day of trading when trading commences,
D the comparative discount.

models to validate to paradigm that security prices can be functionally related to expectations about the financial variables of different firms, such as models constructed by Tinbergen,[1] Durand,[2] Gordon,[3] and Lerner and Carleton[4].

Empirical evidence is that these models are mostly neither statistically significant nor stable. Other attempts to incorporate a risk space in valuation models were equally inconclusive.[5] As Keenan[6] pointed out, although any instability due to statistical problems can be corrected by additional sampling or model specification, yet the instability caused by sampling from a non-uniform universe and fundamental model specification are basic problems that cannot be overcome in the construction of a model. Similarly, the application of this unstable measure to evaluate new issue advisors on a relative scale may lead to inconsistent rankings. Underwriter performance should be measured by the difference in pricing between companies of similar class to detect underpricing. Comparisons should be based on consistent measures which are not subjected to random errors.

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1 Tinbergen, J., The Dynamics of Share Price Formation, Review of Economics and Statistics, 1938.

2 Durand, D., Bank Stock Prices and the Analysis of Covariance, Econometrica, January, 1955.

3 Gordon, M.J., The Investment, Financing and Valuation of the Corporation, R.D. Irwin, Homewood, III, 1962.

4 Lerner, E.M. & Carleton, W.T., The Integration of Capital Budgeting and Stock Valuation, American Economic Review, September 1964.

5 Arditti, F., Risk and the Required Return on Equity, Journal of Finance, March 1967.

Benishay, H. Variability in Earnings-Price Ratios of Corporate Equities, American Economic Review, 1961

6 Keenan, M., Models of Equity Valuation : The Great SERM Bubble, Journal of Finance, 1970, p.252.

By examining the market discount, past studies on new issue pricing focused on the accuracy of the pricing decision rather than understanding the process. These studies have revealed a common characteristic with the share price valuation models, that is, the low explanatory power as exhibited by the statistical measure of significance. Aside from sampling a non-uniform universe or the omission of some variables, this characteristic may arise since the relationship between the discount and some of the explanatory variables have already been accounted for the issue price.[1] However, no conclusive findings have been established to identify factors determining the issue price of a new listing. Since these decisions are made by individual advisors, the pricing process is likely to differ among advisors, as indicated by findings of McDonald and Fisher, and Logue and Lindvall.[2]

Davis and Yeomans[3] considered that the market discount could arise partly as an error or uncertainty in the pricing process, and partly as a systematic element in price fixing to provide an incentive for applicants in the form of an introductory discount. While the uncertainty element can be regarded as random, the systematic element has not so far been identified,

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1 Davis, E.W. & Yeomans, K.A., Observations on Equity Price Discounts in the London New Issue Market, op.cit. p.14.

2 McDonald, op.cit. p.101.
Logue, op.cit. p.213.

3 Davis, E.W. & Yeomans, K.A., Observations on Equity Price Discount in the London New Issue Market, op.cit. p.1

but it can be identified by examining the actual pricing process of an underwriter. Although different underwriters may apply different valuation formulae, each should go through a consistent process of pricing. Furthermore, individual size and capability differences between merchant bankers will cause differences in their pricing decisions. Hence, a study of the pricing decision of new issues should be based on individual merchant bankers. Attempting to consider all new issues in the market at the same time, as in the Davis and Yeoman study[1] will involve heterogeneous data, possibly accounting for the low explanatory power of their study.

Even when one takes the view that the market discount is an outcome of a decision, and as such, it can be measured and applied as a rating of performance, a study of the pricing process is preferable. A study of this nature will enable the less efficient underwriters to review their managerial decision making process and subsequently improve their efficiency. This improvement will assist the less efficient underwriter to become more efficient, by understanding the pricing process of the more efficient. Such a study is also considered by Merrett, Howe and Newbould to be particularly important for the smaller private firm seeking a listing but whose knowledge of underwriting institutions is limited. Thus, the construction of a pricing model will not only benefit the underwriters from an internal management point of view, but also the smaller firms participating in the capital market for the first time.[2]

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1 Davis, E.W. & Yeomans, K.A., Observations on Equity Price Discounts in the London New Issue Market, op. cit.

2 Merrett, op.cit. p.211-2.

Plan of Study

Indeed, the period 1970 - 1974 was a period of "admiration, envy, concern and worry". [1] It was the healthy strength of the economy which brought forth the rise in the market but it was the sudden influx of the unseasoned investors who caused the irregular price movements. The behaviour of these investors can be attributed to the need for financial sophistication, pursuant to its industrial growth since World War II. Jao[2] considered the Hong Kong economy to be in "transition" where the growth in the real sector of the economy had not been accompanied by corresponding specialization in the financial sector. For the self-sustained growth of a transitional economy, it is necessary to promote "innovational finance".

> "Innovational finance" denotes "the whole congeries of financial institutions, markets, and techniques that are appropriate to a transitional economy in which per capita income and capital formation is growing at a fast rate."[3]

In short, "innovational finance" includes financial organisations, financial securities, financial technology and financial markets. All are vital to continue the economic growth of Hong Kong.

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1 Speech by the Hon. Q.W.Lee, on the second reading of Companies (Amendment) Bill at the Legislative Council, November, 1972, HANSARD.

2 Jao, Y.C., Commercial Banking in Hong Kong : An Analysis of its Growth, Structure and Strains 1954-1968, Hong Kong, 1971, p.5.

3 Jao, op.cit. p.10.

The structure of financial organisations in Hong Kong is generally considered well developed with a good network of financial intermediaries linked internationally. With government regulations introduced in the period, the financial markets, including the secondary market and the money market with a wider array of securities, are now serving their respective functions in the economy under good supervision. What remains a continuing effort is the development of new financial technology improving the primary capital market; that is, the new issues market. Its significance lies in the provision of long-term capital to industry and commerce and the offering of new mediums for the public to invest in. In performing this function, it is of crucial importance that the interest of the issuing company and the public be balanced. This calls for increasing sophistication in determining the price of new issues in which both parties have monetary interests. This study is undertaken to meet such a need.

Furthermore, the period 1970 - 1974, is considered appropriate for the study of the pricing decision of issuing houses for two reasons. Firstly, there is a large number of flotations in the period offering a large sample base. Secondly, the period consists of a variety of market conditions which enables the analysis of market factors on decision-making.

The thesis consists of seven chapters. Chapter II examines the economic climate and the structural framework of the new issue market - defining the roles of the market participants. Chapter III traces the growth and the characteristics of the market during the period 1970 - 1974. In Chapter IV, a review is made of the literature on pricing of new issues, developing hypotheses and the methodology for studying the pricing decision. Pricing models for the active issuing houses will be constructed in Chapter V and VI. Chapter VII is devoted to the building of pricing models for the four stock exchanges in order to examine the role of the stock exchanges on pricing. A concerted effort will be made to evaluate the pricing models for issuing houses in conjunction with models for stock exchanges in the concluding chapter.

CHAPTER II

ORGANISATION OF NEW ISSUE MARKET

Before considering the roles of the market participants, it is expedient to review the economic climate and the development of the securities industry.

Economic Climate of Hong Kong

To provide a general background for our study of the new issue market, it is expedient to illustrate the economic growth of Hong Kong in 1970 - 1974 as in Table 2.1 After the political unrest of 1967, the economy was on its way to continuing growth. In 1970, the gross domestic product at constant market prices of 1966 was $15,211 million. By 1974, this figure was at $19,657 million. The average growth rate for the period was 6.5% per annum. In terms of per capita gross domestic product, the average annual growth rate was 4.5%. However, these average growth rates include some variations in individual years: a slowing down in 1971 followed by a recovery in 1972 - 1973 and a subsequent decline in 1974.[1]

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1 Estimates of Gross Domestic Product 1961 - 1975, Census and Statistics Department, Hong Kong Government, 1977, p.2.

TABLE 2.1 Gross Domestic Product 1970 - 1974

(at constant prices of 1966)

	Total GDP		Per Capita GDP	
	Amount (HK$MM)	Annual Growth (%)	Amount (HK$MM)	Annual Growth (%)
1970	15,211	5.7	3,842	3.2
1971	15,704	3.2	3,882	1.0
1972	16,838	7.2	4,129	6.4
1973	19,150	13.7	4,604	11.5
1974	19,657	2.6	4,627	0.5
Average		6.5		4.5

Source: Estimates of Gross Domestic Product,1977

This economic growth was mainly stimulated by the growth of exports. As shown in Table 2.2,the average annual growth rate of exports in the period is 17% per annum. Similar to the growth pattern of the gross domestic product, exports encountered a decline in 1971, a recovery in 1973 and a slowing down in 1974.

TABLE 2.2 External Trade (Exports) 1970 - 1974

	Value of Exports (HK$MM)	Annual Growth (%)
1970	12,347	17.4
1971	13,750	11.4
1972	15,245	10.9
1973	19,474	27.7
1974	22,911	17.6
	Average	17.0

Source: Hong Kong Social & Economic Trends 1964-1974,
Census & Statistics Department,
Hong Kong Government.

Against this favourable economic background, bank deposits grew by an average rate of 20.6% per annum. However, this rate of growth varied from 31% to only 6.4% in 1973 as in Table 2.3. The growth in bank deposits was indicative of the influx of foreign capital, which also brought about the strengthening of the Hong Kong Dollar. At the end of 1970, the exchange rate was HK$6.08 : US$1.00, and was later improved to HK$4.93 : US$1.00.

TABLE 2.3 Total Bank Deposits at end of year 1970 - 1974

	Total Deposits (Including Demand, Time and Savings) (in HK$MM)	Annual Growth in %
1970	14.955	21.6
1971	18,785	25.6
1972	24,613	31.0
1973	26,191	6.4
1974	30,998	18.4
	Average	20.6

Source: Hong Kong Monthly Digest of Statistics
Census & Statistics Department,
Hong Kong Government.

The confidence in the Hong Kong Dollar and the economy was also reinforced by the improved international atmosphere. President Nixon's visit to China and the stabilized Chinese political scene brought forth a healthy contrast from 1967. This was accompanied by a low interest rate prevailing until the June 1973. Thus, a stock market boom developed from late 1972, rising to an unprecedented height in March 1973.

Development of the Securities Industry

With the prosperity, three more stock exchanges were established. Table 2.4 and Table 2.5 show how the market grew significantly in reported turnover. In 1968, with only the Hong Kong Stock Exchange in operation, the total turnover was HK$943 million and in 1970 with two stock exchanges operating, the turnover was HK$6,053 million. In 1973, the total stock exchange turnover was HK$48,880 million, contributed by the four stock exchanges - Hong Kong Stock Exchange (HKSE), Far East Exchange (FEE), Kam Ngan Stock Exchange (KNSE) and Kowloon Stock Exchange (KSE).

TABLE 2.4 Stock Exchange Turnover
(in Million Dollars)

	1968	1969	1970	1971	1972	1973	1974
HKSE	943	2,524	3,057	4,738	10,610	12,326	2,449
FEE	-	21	2,996	7,833	18,130	15,937	5,050
KNSE	-	-	-	2,219	7,739	12,412	3,048
KSE	-	-	-	-	6,405	8,203	887
Total	943	2,545	6,053	14,790	42,884	48,878	11,434

TABLE 2.5 Stock Exchange Turnover
(Percentage of Market Share)

	1968	1969	1970	1971	1972	1973	1974
HKSE	100.00	99.15	50.51	32.03	24.74	25.23	21.42
FEE	-	0.85	49.49	52.96	42.27	32.60	44.16
KNSE	-	-	-	15.01	18.05	25.39	26.66
KSE	-	-	-	-	14.94	16.78	7.76
Total	100%	100%	100%	100%	100%	100%	100%

Source: Far East Exchange Year Book 1976

Among the four stock exchanges, respective market shares also varied. Prior to 1968, Hong Kong Stock Exchange had 100% of the market. In 1970, the first year of incorporation of the Far East Exchange, reported turnover in the Hong Kong Stock Exchange accounted for 51% of the market with the Far East Exchange occupying 49%. By 1973, Far East Exchange had the leading share of 33%, the Hong Kong Stock Exchange and the Kam Ngan Stock Exchange both had 25% and the Kowloon Stock Exchange had 17%.

TABLE 2.6 Comparison of Major Indices*

	Hong Kong Hang Seng Index	New York Dow Jones Ind. Ave.	London Financial Times Index
1970	185.24	753.19	361.4
1971	277.99	884.76	378.4
1972	467.07	950.12	503.9
1973	803.96	924.06	435.6
1974	162.43	596.50	160.1

* Indices at year end. The Hang Seng Index is based on closing prices of selected stocks in the Hong Kong Stock Exchange.

Source: Far East Exchange Year Book 1976

When compared with indices in the New York Stock Exchange and the London Stock Exchange, Hong Kong's stock indicator, the Hang Seng Index, fluctuated widely. As shown in Table 2.6, the rise of 185.24 in 1970 to 803.96 in 1973 means a rise of over 300% in stock prices. Furthermore, this should be qualified with a peak of 1774.96 on 9th March 1973, which is an increase of well over 800%. During this period, 1970 - 1973, the Dow Jones Industrial Average appreciated only by 22.7% and the Financial Times Index by 20.5%.

TABLE 2.7 Comparison of Average P/E Ratio

	Hong Kong*	U.S.A.	U.K.
1969	-	15.83	16.99
1970	-	17.77	14.27
1971	18.64	19.32	18.72
1972	25.43	20.09	19.23
1973	35.51	12.90	11.88
1974	6.70	7.51	4.13

* Based on closing price at year end on constituent stocks of the Far East Exchange Index.

Source: Far East Exchange Year Book 1976

Although figures for average price earnings ratio are not available prior to 1971, data available after 1971 is still meaningful for comparison with other major markets. Table 2.7 illustrates the gradual rise of the P/E ratio from 18.64 to the drastic fall of the P/E ratio of Hong Kong from 35.51 in 1973 to 6.70 in 1974 indicating the wide range of fluctuation. Nonetheless, in 1973, a comparison of the average P/E ratios between Hong Kong and other international markets will reveal that the stock prices in Hong Kong were excessively high.

This growth in the securities industry has been accompanied by the increase in the number of stock brokers. In December 1969, 63 stock brokering firms existed, growing to 831 in November 1973, with over 1,000 members in the four stock exchanges[1].

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1 Speech by the Hon. C.P. Haddon-Cave, Financial Secretary, introducing the Securities Bill 1973 at the Legislative Council, December, 1973, HANSARD.

This growth in activities was also reflected in the growing value of cheques cleared through the commercial banking system as shown in Table 2.8. From a total value of $96,330 million in 1969, the amount rose to $463,854 million in 1973. This was partly caused by an increase in business activities and partly by the growth of the market. With the cash delivery settlement system, increased activities in the stock market will definitely result in an increase in value of cheques cleared. The percentage increase over the previous year was also dramatic. Growth in 1970 and 1971 was 27.8% and 25.5% respectively. In 1972, the increase was 113.0% while the rise in 1973 was 41.%. The subsequent decrease in turnover caused a 24% decrease in the value of cheques cleared in 1974.

TABLE 2.8 Value of Cheques cleared through the Banking System

	Value of Cheques cleared by Commercial Banks (in Million HK$)	Percentage Increase from Previous Year
1969	96,330	
1970	123,136	+ 27.8%
1971	154,493	+ 25.5%
1972	329,059	+113.0%
1973	463,854	+ 41.0%
1974	352,676	- 24.0%

Source: Hong Kong Monthly Digest of Statistics

Table 2.9 shows a marked increase in bank loans and advances to stock-brokers. Expressed as a percentage of total bank loans to all sectors, the share rose from 1.5% in 1970 to 4.2% in 1972. Thereafter, it was gradually reduced to 1% in 1974.

TABLE 2.9 Analysis of Bank Loans and Advances as at end of Year

	Value of Bank Loans to Stockbrokers	Total Value of Bank Loans to all sectors	Percentage
	(in HK$MM)		
1970	143	9,669	1.5
1971	249	11,836	2.1
1972	736	17,726	4.2
1973	503	23,263	2.2
1974	291	29,549	1.0

With the increased activities and the growing number of small unsophisticated investors, the Hong Kong Government was increasingly concerned. As a result, various measures were introduced to regulate market activities in the period. These included the regulation of stock exchanges, the amendment of the Companies Ordinance, the setting up of a Securities Commission and the doubling of the ad valorem stamp duty on share transactions. The introduction of these measures should be viewed against the traditional economic philosophy of laissez-faire in Hong Kong. However, they were essential in a period when "the rise and fall of the stock market .... would have brought a less robust economy to its knees .... that the introduction of disciplines having the force of law is an essential step on the road to full recovery."[1]

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1 Addressed by H.E. the Governor, Sir Murray MacLehose, at the Legislative Council, October, 1973, HANSARD.

Market Structure

In its broad sense, the new issue market should not be restricted to new listings on stock exchanges. It is the issuing of new securities instrument to the public which includes capital raised by both existing quoted companies and unquoted companies on the stock exchanges. This distinction by Henderson[1] distinguishes between old and new companies. These two categories of companies are differentiated by the extent of public knowledge of the company.

A second distinction separates shares which are already in existence from newly created shares. Merrett[2] and associates used this definition to identify new money being raised by newly created shares. The amount of new money is determined by multiplying the number of newly created shares issued by the price per share at which the company sold the shares after deducting all administrative cost of the issue. This definition is appropriate when considering the additional inflow of capital to the company, especially in its economic significance.

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1 Henderson, R.F. The New Issue Market & the Finance of Industry, Cambridge, Bowes & Bowes, 1951, p.24.

2 Merrett, op.cit. p.4.

Furthermore, the pricing of rights of companies already quoted in the market are very much influenced by the prevailing price of the shares in the market. Under the assumption of a perfect capital market, the prevailing share price of a company should adequately reflect valuations of the shares by the investing public. In this respect, the scope of pricing by underwriters is limited. It is the valuations of the new listings which permits greater flexibility and requires more sophistication by the underwriters. Hence, it is the pricing of newly listed shares with which this study is concerned. Pricing of new shares issued by existing companies are excluded from this study.

Unlike the secondary market, the new issue market has no geographic location. A series of procedures in compliance with listing requirements are carried out with detailed organisation, mainly by the issuing house, prior to the first and only transaction in the market. This first and only transaction takes place after investors apply for the new issues, and the allotment of the new shares to investors complete the transaction in the market. Thereafter, the shares of the newly listed company are traded on the floor of the stock exchange constituting the secondary market. Without a physical location, the study of the organisation of the new issue market will be focused on an examination of the listing requirements and procedures and the participants in the market. These participants include the listing stock exchange, the professional valuer and the board of directors. They serve in their own capacity to perform various functions contributing to the offering of the new issue to the public eventually leading to the completion of the transaction alloting shares to investors.

It is therefore essential to examine the relevant procedures and the various functions performed by these participants to gain an insight into the operation of the market.

Listing Procedures and Requirements

In listing a new issue, there is hardly any predetermined procedures to follow other than statutory regulations and stock exchange requirements. Yet these regulations and requirements do pose as constraints thus making the task of handling a new issue a complicated job which requires excellent coordination. Although there is no definite schedule to follow, Wong[1] recognized that there are three stages in the process of issue which have been developed. The first stage identified is when the issuing house enquires into the new issue and subsequently advises the company on the details of issue. The second stage involves the preparations of the underwriting agreement and the final stage is to sell the shares to the investors. A list of the required documents is shown in Exhibit A.

Amidst legal regulations and stock exchange requirements, the process of listings could best be illustrated by constructing a list of procedures which a hypothetical company goes through as shown in Exhibit B. It could well be said that the timing of the procedures is based on general requirements and normal operations. From the list of procedures, it is worth noting that the process of transforming a private company into a public listed company

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1 Wong, K.A., The Stock Market in Hong Kong, Ph.D. thesis, University of Liverpool, 1975, p.176.

takes about 70 days. Nevertheless, depending on individual cases, it may be possible to compress some procedures to shorten the total period. The time length taken to list a share is important in that it affects our perception on how an issue is priced. If the issue price is determined long before the trading date, it may be difficult to estimate the market price which may be affected by the market conditions. From the hypothetical schedule, it can be assumed that from the date the prospectus of the new issue is approved by the Board of Directors, it takes about 26 days before trading on the floor takes place. This period was on occasions condensed into about two weeks. If the pricing of the share is expected to be equal to the market price traded on the floor, it means that an accurate forecast will have to be made about market conditions 14-26 days after the price is determined.

The basis of the new issue is the publication of a prospectus. In essence, the prospectus contains the relevant information of the company which is required by statutory regulations. The accuracy and adequacy of the information published is the responsibility of the reporting parties concerned. Persons responsible for reporting include company directors, reporting accountants, professional valuers and underwriters. It is perhaps unnecessary to go into the details of legal technicalities involved in a new issue, but it is important to point out that regardless of the method of issue and distribution, the issue of a prospectus is required.

Other than statutory requirements, a listing must be admitted by a stock exchange for trading. The stock exchanges will scrutinize the prospectus evaluating the overall desirability of listing the issue from an investor's point of view. This assessment is largely done in a qualitative manner but the information, as reviewed in the prospectus, is of great relevance. While the stock exchanges are concerned about the pricing of individual issues, efforts are always made to accommodate individual pricing differences of issuing houses. In short, the exchanges try to lay down some broad standard for pricing while leaving the individual issuing houses to determine individual pricing.

Along with an application for a new listing, the company is required to undertake to the stock exchange the disclosure of future company information. This is necessary to enable a fair, quick and direct way of communication to keep the investors informed of the progress and performance of the company.

Because of the strain on the banking system in Hong Kong, a public issue, which requires handling of a vast number of cheques, had to follow an arrangement with the banks whereby one public issue was allowed once every 10 days. A master schedule of companies who had been accepted for a public offer in due course was coordinated by the stock exchanges. This meant that the dates of public subscription have to be determined well in advance. Nevertheless, this only applied to public issues, which are large in size. For private placement of smaller issues, listing date schedules are kept by the individual stock exchanges. This therefore resulted in a quicker listing period for private placement as compared with public issues.

The rules governing listings on the four stock exchanges are largely similar and are listed in details in their respective publications.[1] The only difference between the stock exchanges is the minimum market value for a company. Hong Kong Stock Exchange requires a minimum market value at offer of HK$20,000,000 for a new listing. The Far East and the Kam Ngan Stock Exchanges have a minimum value of HK$5,000,000, while Kowloon Stock Exchange has no specific lower limit. However, these figures are merely minimums as specified and may be changed according to individual cases.

Although there are no stock exchange regulations governing the size of private placements or public subscriptions, a company with a capitalization of over HK$50,000,000 may have to be listed by public subscription because of the limited placement capacity of stock brokers.

As an legal requirement, new issue prospectuses have to be cleared with the Registrar General, together with all supporting documents. Under the Companies (Amendment) Ordinance 1972, he has powers to refuse registration of a prospectus in case statutory requirements are not met or if it contains any information which is obviously likely to mislead.

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1 Admission of Securities to Quotation, Hong Kong Stock Exchange Ltd., July 1975.

Rules and Regulations Governing the Official Listings of Securities, Far East Exchange Ltd., 1971.

Rules and Regulations Governing the Official Listings of Securities, Kam Ngan Stock Exchange Ltd., 1976.

Requirements for Quotations, Kowloon Stock Exchange Ltd.,1976.

The Stock Exchanges

Of the four existing stock exchanges, only one, the Hong Kong Stock Exchange, existed in the mid-1920's[1]. Until 1969, it operated as the only stock exchange in Hong Kong. The Far East Exchange was incorporated on 31st October, 1969. The Kam Ngan Stock Exchange began operation on 2nd March, 1971 and the Kowloon Stock Exchange began operation in the beginning of 1972. There had been no limitation on the number of stock exchanges before 1972. In November, 1972, it became government policy that no further stock exchanges would be permitted.

As a result of the growth of the market, total market turnover in 1965 amounted to HK$389,000,000, increasing to HK$6,053,000,000 in 1970, to HK$14,792,000,000 in 1971, to HK$42,753,000,000 in 1972, to HK$48,880,000,000 in 1973 and subsiding to HK$11,436,000,000 in 1974. Amidst the increased turnover, the respective market shares of the four stock exchanges differed. In 1972, the Far East took 42.1% of the market, Hong Kong Stock Exchange 24.82%, Kam Ngan Stock Exchange 18.1% and Kowloon Stock Exchange 14.98%. In 1974, the Far East had 44.16%, the Hong Kong Exchange 21.42%, Kam Ngan Stock Exchange 26.66%, and Kowloon Stock Exchange 7.76%.

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1 Speech by the Hon. Philip Haddon-Cave, Financial Secretary, in Legislative Council, Wednesday, 12th December 1973.

The organization of the stock exchanges is largely similar in nature. The stock exchanges are run by the Stock Exchange Council or General Committee, with varying sizes of membership. For example, the Hong Kong Stock Exchange Council consists of 9 members and the General Committee of the Far East Exchange consists of 15 members. To a large extent, the organization of the stock exchanges in Hong Kong is very similar to its counterpart in London. The organizational pattern carries with it the characteristic of a private club or voluntary association,[1] because of the informal way in which they operate.

To qualify for membership, a member has to be a Hong Kong resident for 5 out of the 7 preceding years, above 21 years of age, and not a director or employee of a licensed bank[2], or a solicitor or professional accountant holding a current practising certificate except those who were already members before the enactment of the Securities Ordinance. Trading on the floor is transacted by direct transaction between members. This is different from the jobber system in London or the specialist system in New York. The mechanics of the transactions simply require a member or his representative to pose bid or offer prices on the trading board.

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1 Wong K.A. op.cit. p.354.

2 Securities Ordinance 1974, Section 25.

A transaction is effected by another member dealing at the bid or offered price posted on the board. Posting on the board is on a first-come-first-serve basis with a queuing system. This direct dealing system has a merit of enabling the free fluctuation of share prices. In contrast to this free market structure, a jobber system probably provides less fluctuation in share prices with the jobber dealing as a principal with a long or short position. The volatile market conditions are sometimes attributed to this open market system.

In conjunction with the open market system, a 24-hour delivery system is used for settlement of share dealings. Unlike the London delivery system making use of settlement dates of 2 or 3 weeks, the Hong Kong system of 24-hour delivery is intended to minimize short selling. In conjunction with this delivery system, settlement is made on a cash basis with physical handling of the scripts which, with street name deliveries, eliminates the need for registration of transfer of shares between shareholders after each transaction.

The trading hours of the stock exchanges are in two sessions, 10.00 a.m. to 12.30 p.m. and 2.30 p.m. to 3.30 p.m., Mondays to Fridays.

Transactions on the trading board are in fixed quantities of a board lot. This is a unit of trading, depending on the price of a share, which permits the members of the stock exchanges to deal in multiples of the board lots.

After completion of a transaction of the trading board, the selling broker of the transaction has to make out a record of the transaction in triplicate. After endorsement by buyer, one copy of it is deposited with the stock exchange, confirming the transaction. Another copy is delivered to the buyer, and the third copy is for retention by the selling broker. After a transaction has been effected on the dealing board on the exchange floor, the transaction will be recorded manually on the trading board.

Although the stock exchanges are the market place for the secondary market, rather than the primary market, they do pose as constraints on the new issue market. When a company raises capital from the new issue market, it is the secondary market which draws attention from the prospective investors. With a stock exchange listing, this indicates that the shares can subsequently be sold in the secondary market. Furthermore, listings on different stock exchanges may carry different expectations regarding the marketability of the new issue. Despite the uniformity of the mechanics of the four stock exchanges, the members of the different stock exchanges may represent different clientels. The clientel usually determines the depth of the trading capacity of the stock exchanges. Since the four stock exchanges have their different governing councils or general committees, the requirements for pricing in their different stock exchanges may not be uniform. The different pricing requirements pose constraints on different issuing houses, thus affecting the pricing

of new issues in the primary market. These pricing standards, imposed as constraints on issuing houses,involve qualitative assessments by the stock exchange's Listing Sub-Committee, or in the case of Hong Kong Stock Exchange and the Kowloon Stock Exchange, the decision is made by the governing Council. For the Hong Kong Stock Exchange,its members are professional stock-brokers. In the Far East, Kam Ngan and Kowloon Stock Exchanges, the Listing Committee consists of lawyers, accountants, and businessmen including some real estates developers. Although members of the Listing Committee may also own a seat on the exchange, each member has his professional background. With the diversified background of the individuals granting admission to new issues, it is certainly realistic to assume that although the committee may look at different issues in varying details, there should be some consistencies with respect to the logical derivation of a price for a new issue.

Issuing Houses

Functionally, the issuing house advises the issuing company on all aspects of the new issue operation. Because of the complicity involved in floating an issue, detailed planning is required to meet both statutory regulations and stock exchange requirements. The completion of flotation procedures in a short time is also important since the success of a floatation very often depends on an appropriate market condition. Listings in the wrong market condition may result in an undersubscription or perhaps a financial loss to the issuing house.

Operationally, the issuing house advises its clients on the method of issue, the type of security to be issued,and the price and terms of the flotation. In executing these functions, the issuing house acts as an intermediary between the issuing firm and the body of investors.[1] In its unique position, the issuing house has to satisfy both the issuing company as well as the body of investors. The reason for satisfying the issuing company is obvious, since the fees and commission charges for the new issue are sources of income for the issuing house. On the other hand, it has to ensure that the investors are satisfied with the issue price and terms of the flotation. This satisfaction should be viewed with a long-term prospective, which normally should reflect an adequate rate of return to the investors. Failure to fulfil

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1 Merrett, A.J., Howe, M., and Newbould, C.D., op.cit. p.17.

this responsibility to investors will hamper the reputation of the issuing house in the long-term. Furthermore, the issuing house looks at the issued price as its professional indication to investors on an issue which has never been traded before in the open market. Similar to London issuing houses, this professional indication is backed-up by accounting and legal investigations into the company. If the issuing house is not satisfied with some aspects of the firm, it will simply refuse to handle the issue.

After a decision has been made to float a new issue, the issuing house underwrites the flotation. To the issuing company, underwriting will ensure that the amount of finance required by the company will be made available since any undersubscription will be taken up by the issuing house or underwriter. In London, underwriters may look for sub-underwriters to share in the proceeds together with the risks of underwriting. It must be stressed that it is not so much the financial risk of the underwriting which the issuing house shares but rather a practice in the trade to maintain a good relationship with other underwriters. Like London merchant bankers, issuing houses in Hong Kong participate in a new issue as joint-underwriters. Technically, this practice means that the name of the joint-underwriters appear in the prospectus together, putting the reputation of all underwriters as an indication of quality of the share. In addition, sub-underwriting may in turn be arranged. Generally, a commission

of 2% is paid to the underwriter, who in turn may pay out 1% to the sub-underwriters. In London, the issuing houses are professional merchant bankers, but the Hong Kong issuing houses and underwriters are mostly commercial banks or commercial bank related organisations. Of the top nine underwriters, only two, Jardine Fleming and Oriental Financial Consultants, are not related to any commercial banks. Three out of the top four merchant bankers, Wardley, Jardine Fleming and Schroders & Chartered, are staffed by senior personnel who are familiar with merchant banking in the City of London. Rarely did stock-brokers participate in new issue flotations, other than Japanese or American brokers who underwrote issues occasionally.

The Regulatory Bodies

In terms of regulating by statute, two government bodies are essentially involved in the new issue market. Prior to the setting up of the Securities Advisory Council in January 1973[1], the only government organization involved in handling new issue prospectus was the Registrar General. The responsibility of the Registrar General is to register limited companies and enforce the Companies Ordinance. In receiving a new issue prospectus, he is essentially concerned in registering the main document and checking the accompanying supporting documents to see if they abide the legal framework. He is not concerned with the verification of contents of a prospectus. Except when legal requirements are not met, the Registrar General would refuse any prospectus submitted to him. Technically speaking, he offers comments to the issuing houses on the draft of the prospectus, but he is in no way concerned with the pricing aspects of the issue or the methods of issue.

When the Securities Advisory Council was established in 1973, it acted in an advisory position to the government with no statutory power. The Securities Advisory Council with seven members, including the Securities Commissioner, put forward suggestions to regulate the stock exchanges in the Securities Bill in October 1973. Although the Securities Bill

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1 Far Eastern Economic Review, "New Hong Kong Record", 15th January, 1973, p.50.

was concerned mainly with setting up a mechanism for the smooth running of the secondary market, the Council did introduce indirect measures of guidance in the new issue market. One of these measures referred to the minimum percentage of shares distributed to the public. The Council aimed at providing a better market in depth for a new issue company. The schedule is shown in Table 2.10.

TABLE 2.10 Minimum Percentage Distribution to the Public

Market Capitalisation of the Issuing Company	Minimum % distributed to the public
$15,000,000 - $19,999,999	45%
$20,000,000 - $24,999,999	40%
$25,000,000 - $29,999,999	35%
$30,000,000 - $34,999,999	30%
Above $35,000,000	25%

Other guidelines were concerned with the earning capacity of the assets and the likely future of the company with the view to help the promoters and others to support only those companies which were suitable as investments for the public at large. Shortly after these guidelines were introduced, the new issue market became inactive and these guidelines were not tested in operation. Nonetheless, these guidelines will affect listings in the future. Aside from these guidelines, an informal practice has been introduced for new issues. Prior to admitting a new listing, the stock exchanges and issuing houses would ask for comments from the Securities Commission which is not a statutory requirement.

On 22nd February, 1974, the Securities Ordinance was enacted creating a 7-man Securities Commission, including the Commissioner of Securities with powers to regulate the activities of the brokers and the stock exchanges.[1] A Federation of Stock Exchanges was established among the four Stock Exchanges to communicate with the Commission, to encourage training of future stock brokers, to provide for professional qualifications by examinations of stock brokers and to settle disputes in the industry. The Ordinance also provided for compulsory registration of stock-brokers and the setting up of a compensation fund for members of the stock exchanges comprising of $25,000 per member in cash and $25,000 in the form of a bank guarantee. There was also a ban on short-selling, option dealing and forward trading. Although no special regulation of new issues is specified in the Ordinance, this overall improvement to the secondary market may enhance the primary new issue market.

It is true that there is no government department with powers to verify the contents of a prospectus before issue. However, the professional advisors, particularly the solicitors, have a responsibility to ensure that statutory requirements are compiled with and that all information as contained in the prospectus must reflect the true position of the firm. There has been a considerable improvement in this respect and in practice, information in the prospectus is checked and rechecked. Any inaccurate, misleading or even fraudulent representation may lead to civil or criminal penalties.

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1 Hong Kong Government Gazette, Securities Ordinance 1974, 22nd February, 1974.

Reporting Accountants

The Companies Ordinance requires that the prospectus of the issuing company must contain a report by auditors of the company. In some cases, this report is prepared by the auditors of the issuing company and in other cases, the issuing house may appoint a reporting accountant other than the company auditors whose work it is familiar with. Although there is no legal provision governing the appointments of reporting accountants, it is desirable to appoint reporting accountants other than auditors of the firm to maintain "an independence of mental attitude".[1]

The task of the reporting accountant is the preparation of the past accounts, the industrial environment, current trading and future prospects, and cashflow position. These reports will form the basis of the new issue prospectus though they may not be published in whole in order to prevent the prospectus becoming unnecessarily detailed and burdensome. These detailed documents will assist the issuing house to make decisions as to the terms and price of the flotation. There is no set format on the form or the length of these reports. However, the past financial accounts will help to indicate the change in capital structure, past profit performances, basis of accounting and any special aspects of the company. The industrial environment will incorporate the industrial climate with respect to market, competition, production and sales method, employment policies, etc. This will probably be analyzed with respect to the

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1 Corbett, G., "How Independent is Independent?" Going Public 1972, Haymarket Publishing Ltd., London, 1972,p.65.

management of the company. Reports dealing with assets will probably contain opinions of professional valuers reflecting valuations of tangible and intangible assets. Projections on the future profit and cash position will assist the issuing house to determine capital requirements, dictating the terms of the flotation, and the profit forecast forms a basis of the pricing decision. Furthermore, the assumptions inherent in the construction of the forecast should be included in the report, thus, permitting the issuing house to consider whether the projections are realistic.

Perhaps, the most important document of interest to the merchant banker is the profit forecast. When interpreting the profit forecast, it is important to distinguish the stability of earnings. Stable income is relatively easy to define because it arises from fixed contracts or leases, etc. For businesses which are less stable, it is difficult to project profit and earnings. In the case of trading companies, it may be possible to evaluate agencies on hand or textile quotas it had in the past. However, only qualitative valuations can be made out of the profit forecast as agencies can change hands and international trade restrictions may not last for ever. Assumptions about the future growth of the market, the general trend, and the market share of the particular company must be considered carefully to assist issuing houses in their pricing decision. Furthermore, the profit forecast must be subjected to consistent accounting principles, for example, a consistent principle of valuation of stocks or allocation of cost.

Although cashflow projections are often not included in the prospectus, they are necessary to consider both the financial stability of the company and the viability of the declared dividend policy by the company. Very often, this aspect is covered by a statement in the prospectus on the opinion of the Board of Directors that working capital is sufficient in the foreseeable future. Although the legal liability rests on the Board of Directors, it can be assumed that their opinion is usually based on a carefully prepared cashflow forecast of the reporting accountant.

Prior to the publication of the prospectus, the reporting accountant will also need to conduct a "subsequent events review".[1] This review ensures that all financial records and minutes of meetings are up-to-date and conform to facts revealed in the prospectus. Finally, the reporting accountant must express his consent to the issue of the prospectus by a letter to the company which forms a part of the submission to the stock exchange and Registrar General. In essence, while it can be said that the role of a reporting accountant is ensuring a true reflection of the financial position of the issuing company, the data he provides form the basis of decisions by the issuing houses. An example of a profit forecast and a company balance sheet is shown at Exhibit C.

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1 Watts, T., "The Accountant's Report", Going Public 1971, Haymarket Publishing Ltd., London, 1971, p.21.

Professional Valuers

Since a large number of property companies were listed in this period, it would be useful to examine how property values are determined for new issues. In a new issue prospectus, the assets of the company can be valued either by a director's assessment or an opinion of a practising professional valuer. Generally, if an issuing company has assets like properties and shipping, the stock exchanges concerned will look for a professional valuer's opinion to be included in the new issue prospectus. In assessing the value of land for a company prospectus, the valuer's role is two-fold.[1] First, the valuer has to advise the issuing company of the expected market value of the property. Second, his valuation will help the investing public and issuing houses to judge whether the issue price is reasonable.

The significance of the valuer lies in the incorporation of his valuation in the net asset value of the issuing company, which in turn affects the pricing of the new issue. However, it should be remembered that a valuer's opinion is affected by the market condition as well. It is commonly conceived that Hong Kong, with an area of about 400 square miles and a population of over 4½ million, has an acute problem of land shortage. Hence, land prices are always expected to carry capital appreciation. In particular, between the end of 1972

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1 Roberts, P.J., Valuation of Development Land in Hong Kong, Hong Kong University Press, 1975, p.3.

and early 1973, the stock market was enjoying an unprecedented boom. Investors who have made substantial profits in the market in turn purchased flats. The overall expansion of the stock market and the real-estate market by the increasing numbers of participants led to a boom in both sectors. This relationship between the two markets should be realized when pricing new issues. Admittedly, the role of a valuer becomes difficult in such market conditions. Theoretically, the professional valuer can distinguish the intrinsic value of the property from the current market value which reflects expected capital appreciation. However for practical reasons, the two are hardly distinguishable in an over-heated market. How could the valuer tell his client that the value of his land was, say HK$500,000 when other similar land was selling at HK$1,000,000? In the market conditions of a feverish boom, Roberts suggested that valuation in a company prospectus should not be taken at the amount that a valuer would advise his client to pay for the land for development purposes but rather with reference to market conditions and transactions at the time.[1]

Since valuations by professional valuers can affect the asset value of the issuing company, it is necessary to examine the techniques of valuation. The most common approach is known as the "Residual Valuation" technique. This approach considers the maximum development value of the land by assessing the value of the completed building and then deducting cost, interest and profit, giving a residue as the price that can be paid for the land.

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1 Roberts, P.J. op.cit. p.4.

Yet taking this residual valuation alone is inadequate because minor variations in assumptions about cost and interest rate can lead to substantial variations in the final assessment. It would therefore be desirable to consider market prices of comparable land as well as the residual valuation. Furthermore, it must be emphasised that in assessing the ultimate value of the completed building, the likely market price at that time has to be taken into consideration.

To facilitate more detailed analysis for land value, the accommodation value approach can be applied. This involves an analysis of the sale of land in terms of dollars per square foot of the potential gross floor area that is possible on the site. This arises because of different site coverage permitted by the Building Ordinance on different classes of sites. For instance, Class A site may be permitted a 30% site coverage whereas a Class B site can provide a 33% site coverage. This approach is a simple rule of thumb calculation but in comparison between different sites, the potential of each site must be taken into consideration adequately. An example of residential and commercial valuation is shown at Exhibits D-1 and D-2. Because of the complication of the valuation, it will be difficult to discuss this aspect in great detail in this study. Nevertheless, it must be stressed that the prevailing market price exerts considerable influence on the valuer in assessing value since assumptions have to be made about

the expected sales or rental values of the completed buildings. Although there is a certain degree of interdependence between stock market conditions and property values, it can be assumed that a professional valuer will base his valuations on the property market rather than the stock market. In any event, his valuation decision will not be affected by the new issue market since operationally, the valuer's opinions are always presented prior to the pricing decision made by the issuing house. Thus, property valuations by professional valuers are independent of the pricing of a new issue.

Board of Directors

In Hong Kong, there are four common reasons and possibly a fifth why a company seeks a public quotation. One basic reason is to raise additional capital to finance expansion when it is not possible to do so by internally generated funds or funds raised privately. Another reason is for the diversification of the company into new ventures. This differs from expansion in the sense that the funds are applied towards financing new activities. A third reason is for the repayment of loans. This reflects activities already undertaken and the public quotation facilitates the change in the form of financing, from a medium-term loan to long-term equity financing. The fourth reason may be personal reasons of existing shareholders which makes it desirable to sell off some of their holdings to the public. For instance, the payment of estate duty may require disposal of assets of a private company and thus disrupts the firm. Public quotation will enable easier disposal of shares in the market rather than sale of the company's assets. Alternatively, shareholders in a private company may want to liquidate their holdings so as to diversify their own business activities by reinvesting the proceeds in other new business ventures. Another possible reason may be due to the Board of Directors' desire to enhance the reputation of the company by listing. By satisfying stock exchange's requirements, this will indicate to the public the reputation of the company and improve future business opportunities. It would also tend to make the company better known to the public which is particularly

good for companies providing or selling consumer goods or services. Of the above reasons, expansion, diversification and repayment of loans are specifically revealed in the new issue prospectus, but of course liquidation of individual's holdings for purely personal consideration are not mentioned.

Table 2.11 shows that of the total 220 companies studies, 58% specified expansion as a reason for public quotation. 15% raised public funds to diversify into activities other than their existing line of business. 15% used the proceeds of the issue to repay loans financing existing activities. 31% did not specify any purpose. These can be interpreted as special considerations of a personal nature to existing shareholders.

TABLE 2.11 Reasons for Public Quotation as revealed in Prospectus

	Number of New Issues	Percentage in terms of 220 companies
Expansion	127	58%
Diversification	33	15%
Repay Loans	34	15%
Others	9	4%
Purpose Not Mentioned	68	31%
T O T A L	271*	

* Of the total of 220 companies, 51 companies gave two reasons for going public.

The Board of Directors is important in the management of the company. Assessment of management is undoubtedly a difficult task. Different industries with different individual particulars require different management skills. In general, assessment of management and the Board of Directors are done qualitatively in Hong Kong. To some extent, the compactness of the business community contributes to a better feel for individual companies. Some merchant bankers make use of their own network for assessing the quality of management through indirect links and credit enquiries. Admittedly, forecasting and evaluation often contain a large subjective element. Notwithstanding the lack of precedents in Hong Kong, any misjudgements of the company management could be remedied by the responsible issuing house offering to buy back shares issued which has been done in the City of London,[1] when it is obviously a practice which is fraught with risk for the issuing house.

Another phenomenon worth noting is the large number of companies in Hong Kong which are family-owned or closely held before they are floated in public. As no legal requirement

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1 Collins, N. "The Management Malaise", Going Public 1973, Haymarket Publishing Ltd., London, 1974, p.25.

exists to disclose nominee holdings in prospectuses, it is not possible to identify the scale of the phenomenon. Nevetheless, it appears that in some cases, the Board of Directors does influence the pricing of the new issue. For example, the Board of Directors may require the issuing houses to price the shares low so as to achieve a high over-subscription ratio because it is felt that this will enhance the reputation of the company. In such cases, the company is in fact acting in the interest of the prospective investors rather than aiming at larger proceeds of the issue. Aside from such individual cases, it can be said that the Board of Directors of issuing companies are usually not concerned with the pricing of the new issue, relying on the issuing houses to price and underwrite their shares.

CHAPTER III

OPERATION OF THE NEW ISSUE MAREKT 1970 - 1974

This study examines new issues of Hong Kong companies during the period 1970 - 1974. However, there is only one company issue in 1974, i.e. Cross Harbour Tunnel Limited. No useful purpose is served by extending this study to cover the year of 1974. Hence, this company will be analyzed when necessary but will be excluded in some parts of the study.

The New Issue Market

The new issue market consists of two components, namely new money raised by companies listed for the first time and, secondly, money raised by listed companies. In this study attention will be focused on companies listed for the first time and no in-depth analysis is made for new money raised by companies already listed, though it is desirable to understand the size of this market segment. The amount of money raised by rights issues has been $4,115 million compared to $3,666 million raised by new listings.

TABLE 3.1 Number of Rights Issues by Industrial Classifications 1970-1974

	1970	1971	1972	1973	1974	Total	Percentage
Utilities	-	3	-	2	-	5	10.2%
Land & Constructions	2	2	5	1	-	10	20.4%
Commercial & Industrials	2	7	3	3	-	15	30.6%
Docks, Wharfs, Godowns	1	1	-	-	-	2	4.1%
Hotels	1	-	1	-	-	2	4.1%
Textiles	1	-	2	2	-	5	10.2%
Investments	2	2	2	1	-	7	14.3%
Shipping	-	1	1	1	-	3	6.1%
	9	16	14	10	0	49	

Source: Far East Exchange Year Book 1976

As shown in Table 3.1 Commercial and Industrial companies ranked high in terms of number of rights issues with 15 issues, i.e. 31%; Land and Construction companies with 10 issues or 20%. Other with a relatively large numbers of righrs issues are Utilities, Textiles ,and Investment companies.

TABLE 3.2 Value of Rights Issues by Industrial Classification 1970 - 1974 (in Million of Dollars) Total = $4,114,823,956

	1970	1971	1972	1973	1974	Total	%
Utilities	-	182	-	92	-	274	6.7
Land & Constructions	1,548	309	270	30	-	2,157	52.4
Commercial & Industrials	41	279	172	215	-	707	17.2
Docks, Wharfs, Godowns	4	76	-	-	-	80	1.9
Hotels	75	-	66	-	-	141	3.4
Textiles	20	-	15	55	-	90	2.2
Investments	24	45	122	229	-	420	10.2
Shipping	-	89	152	5	-	246	6.0
	1,712	980	797	626	0	4,115	

Source: Far East Exchange Year Book 1976

Table 3.2 illustrates that, in terms of the total value of rights issue, the Land and Construction group has 52% of the market at $2,157 million. The Commercial and Industrials category has 17% with $707 million. Others significant in value are Utilities, Investments, and Shipping companies.

TABLE 3.3 Average Value of Rights Issues by Industrial Classification 1970 - 1974

	No. of Rights Issue	Total Value of Issue (in Million $)	Average Value of Issue (in Million $)
Utilities	5	274	54.8
Land & Constructions	10	2,157	215.7
Commercial & Industrials	15	707	47.1
Docks, Wharfs, Godown	2	80	40.0
Hotels	2	141	70.5
Textiles	5	90	18.0
Investments	7	420	60.0
Shipping	3	246	82.0
	49	4,115	84.0

From Table 3.3, the average value of the issues indicates that Land and Construction companies are popular in fund raising, with an average value of $215.7 million per issue. Commercial and Industrial companies, though impressive in number, have an average value well below the aggregate average size of $84 million per issue. Shipping companies seem to be of larger sizes in this market segment with an average size of $82 million. This analysis indicates that three groups, Land and Construction, Shipping, and Hotels are the groups which have raised relatively large sums of new money. It is worth noting that these categories which have raised relatively more new money are those which usually carry more tangible assets, like buildings and vessels.

The other component of the new issue market involves the listings of new companies. Of the total 297 shares listed at the end of 1974, only 96 existed prior to March 1972. Excluding the listings of overseas companies, a total of 220 local companies shares were floated in the period 1970-1974.

TABLE 3.4 Number of Listings on Stock Exchanges 1970 - 1974 = 220

	1970	1971	1972	1973	1974	Total 5 Years	% of Total
HK	19	7	17	2	-	45	20.45%
FE & KN	-	-	62	38	-	100	45.45%
HK, FE & KN	-	-	2	10	1	13	5.90%
FE	5	3	1	-	-	9	4.10%
KLN	-	-	10	42	-	52	23.64%
HK & FE	-	-	-	1	-	1	0.46%
T O T A L	24	10	92	93	1	220	100.00%

Table 3.4 shows that 100 companies sought listings in both Far East and Kam Ngan Stock Exchange, being 45% of the total listings. Hong Kong, Far East and Kowloon have independently listed 20%, 4% and 24% respectively. Kam Ngan Stock Exchange appears to be the only stock exchange which did not list any issues independently but it has admitted 5.9% of the issues admitted by Hong Kong and Far East.

In terms of the values of listings, a total of HK$3,666 million has been raised in the market in the four stock exchanges. The distribution is shown in Table 3.5.

TABLE 3.5 Value of Listings on Stock Exchanges 1970-1974 = $3,666,143,270 (in Million Dollars)

Stock Exchanges	1970 Value in HK$	1971 Value in HK$	1972 Value in HK$	1973 Value in HK$	1974 Value in HK$	Total 5 Yrs. (Percentage)
HK	325	152	392	34	-	903 (24.65%)
FE & KN	-	-	847	390	-	1,237 (33.73%)
HK, FE & KN	-	-	398	550	166	1,114 (30.37%)
FE	27	29	11	-	-	67 (1.83%)
KLN.	-	-	23	242	-	265 (7.24%)
HK, FE	-	-	-	80	-	80 (2.18%)
T O T A L	352	181	1,671	1,296	166	3,666

The market capitalization of companies seeking a corresponding listing on Far East and Kam Ngan accounted for 34% of the total, while the Hong Kong Stock Exchange alone raised 25%. In terms of value of new money raised, an interesting observation is that issues listed jointly on the Hong Kong, Far East and Kam Ngan Stock Exchanges accounted for 30% in value. This figure is particularly significant when compared with only 5.9% in terms of numbers of issues. This indicates that the flotation when listed in all three stock exchanges were of substantial size. Of the 13 listings, an average of HK$86 million was raised per issue. In contrast, the Kowloon Stock Exchange accounted for only 7% in value but 24% in number of listings. Of the 52 companies listed, this means an average value of $5 million per issue. For listings on the

Hong Kong Stock Exchange alone, the average value per issue was $20 million and on the Far East and Kam Ngan over $12 million per issue. The above figures indicate that the Kowloon Stock Exchange tended to list companies of smaller size and raise comparative less funds per issue. Issues on the Hong Kong Stock Exchange were relatively larger but issues of sizes averaging around $80 million had to be floated on the three leading stock exchanges simultaneously. Thus, it seems that the flotation of a large company has to be made in the three stock exchanges with broader market activities.

TABLE 3.6 Number of Listings by Industrial Classifications 1970-1974

Industrial Classifications	1970	1971	1972	1973	1974	Total	Percentage of Total
Banks	-	-	4	2	-	6	2.7%
Utilities	-	-	-	-	1	1	0.5%
Land & Constructions	7	1	54	56	-	118	53.6%
Commercial & Industrials	6	4	6	12	-	28	12.7%
Docks, Wharfs, Godowns	-	-	1	-	-	1	0.5%
Hotels	4	1	4	2	-	11	5.0%
Textiles	7	2	9	2	-	20	9.1%
Investments	-	1	8	9	-	18	8.2%
Shipping	-	1	6	10	-	17	7.7%
T O T A L	24	10	92	93	1	220	100.0%

In terms of industrial classifications as shown in Table 3.6, a total of 9 industries raised new money in the new issue market. Of the 220 companies listed, 118 were land companies or construction companies, which was 53.6% of the total. Commercial and industrial concerns had 12.7% of the market, with 28 listings, while textile companies accounted for 9.1%, investment companies for 8.2% and shipping for 7.7%.

TABLE 3.7 Value of Listings by Industrial Classifications 1970 - 1974

(in Million Dollars)

Industrial Classifications	1970 Value in HK$	1971 Value in HK$	1972 Value in HK$	1973 Value in HK$	1974 Value in HK$	Total 5 Yrs. (Percentage)
Banks	-	-	165	150	-	315 (8.60%)
Utilities	-	-	-	-	166	166 (4.53%)
Land & Constructions	113	5	1,080	640	-	1,838 (50.15%)
Commercial & Industrials	94	76	71	89	-	330 (8.99%)
Docks, Wharfs, Godowns	-	-	8	-	-	8 (0.20%)
Hotels	79	35	32	23	-	169 (4.60%)
Textiles	67	25	86	9	-	187 (5.09%)
Investments	-	31	139	59	-	229 (6.26%)
Shipping	-	9	89	326	-	424 (11.58%)
T O T A L	353	181	1,670	1,296	166	3,666

Table 3.7 shows that land and construction companies were significant also in value of listings, accounting for over 50% of the market in the 5 years. This indicates the popularity of property companies in the period. Shipping, commercial and industrial companies, together with banks respectively raised 12%, 9%,and 9% of funds in the market.

TABLE 3.8 Average Value of Listings By Industrial Classification 1970 - 1974

	Total No. of Listings	Total Value of Listings (in Million $)	Average Value Per Listing (in Million $)
Banks	6	315.4	52.6
Utilities	1	166.0	166.0
Land & Constructions	118	1,838.5	15.6
Commercial & Industrials	28	330.0	11.8
Docks, Wharfs, Godowns	1	7.5	7.5
Hotels	11	168.3	15.3
Textiles	20	186.5	9.3
Investments	18	229.4	12.7
Shipping	17	424.5	25.0
Total	220	3,666.1	16.7

It is also meaningful to look at the average size of each listing in different industries. From Table 3.8, the utility issue ranks high with only one listing of a total value of HK$166 million. In terms of average size, the bank and shipping industries surpassed the property sector with an average size of HK$52.6 million and HK$25 million respectively, compared to land and construction of only HK$15.6 million. This indicates a fairly large number of smallish property companies since the average value per listing for property companies was even below the total average size of HK$16.7 million per listing.

Company Size

The sizes of companies can be measured in various ways, all with individual disadvantages. Sales volume may differ between industries. Market capitalisation varies with the share prices in the market while net assets depends on valuations. A more stable measure to examine the sizes of companies in the new issue market is the net tangible asset value of listings in the period since assets are usually revalued before flotation. Table 3.9 shows that over 46% of the new companies listed were small companies with net assets below $20 million. About 35% of the companies floated in the period were medium size companies with $20 - $49.9 million of assets. Only 18.26% are companies with over $50 million assets. In 1972 and 1973, there was an increase in the size of new issuing companies, when compared with years of 1970 and 1971.

TABLE 3.9 Number of Issues by Net Asset Value of New Issues in Hong Kong 1970-1974

Year	Below $10MM	$10 - $19.9MM	$20 - $29.9MM	$30 - $39.9MM	$40 - $49.9MM	$50 - $99.9MM	Over $100MM
1970	6	6	6	3	-	-	2
1971	1	2	5	-	-	1	1
1972	18	20	18	15	4	10	7
1973	18	31	10	10	6	10	8
1974	-	-	-	-	-	-	1
Total	43	59	39	28	10	21	19
Percentage	(19.63)	(26.94)	(17.81)	(12.79)	(4.57)	(9.59)	(8.67)

Table 3.10 compares the net asset values of new issues in London and Hong Kong. It is important to note that the period of study is different, London 1966 - 1974 and Hong Kong 1970 - 1974. The exchange between the pound and dollar also fluctuated, in 1970, the exchange rate was £1 : HK$14.47 but in 1973, the rate was £1 : HK$11.80.[1] Despite time duration and exchange rate differences, a comparison is still of interest. Proportionally, there is a large number of small companies with assets below £1 million floated in London than Hong Kong. There is also a lower percentage of large companies with assets over £5 million floated in London than Hong Kong.

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1 Hong Kong Monthly Digest of Statistics, November 1974.

TABLE 3.10 Comparison of Net Assets of New Issues in London and Hong Kong

London[1] 1966 - 1974			Hong Kong 1970 - 1974		
Net Tangible Assets (MM)	No. of New Listings	Percentage of Total	Net Tangible Assets ($MM)	No. of New Listings	Percentage of Total
Below 1	497	59.0	Below 10	43	19.6
1 - 1.9	178	21.1	10 - 19.9	59	26.9
2 - 4.9	85	10.1	20 - 49.9	77	34.9
5 - 9.9	53	6.3	50 - 99.9	22	10.0
Over 10	29	3.5	Over 100	19	8.6
Total	842	100.0	Total	220	100.0

The comparison in Table 3.10 should be viewed in the light of the large numbers of property companies listed in Hong Kong during this period. Between 1966-1974, 6.6% of companies listed in London are property companies[2], while in Hong Kong 53.6% are of the Land & Construction category. Another plausible explanation is the inflated property values accompanying the unprecedented stock market boom in Hong Kong, whose magnitude was not experienced in London.

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1 Vaughan, G.D., Grinyer, P.H. & Birley, S.J., From Private to Public, Woodhead-Faulkner, 1977.

2 op.cit. p.132.

Method of Issue

In the literature of finance, five methods of new issues are commonly defined. These are :-

(1) The Public Subscription method,

(2) The Placement method,

(3) The Offer for Sale method,

(4) The Stock Exchange Introduction method,

(5) The Offer by Tender method.

The Public Subscription method, the Placement method and the Introduction method are largely used in their respective conventional meanings. The term "Offer for Sale" is used in Hong Kong in a totally different context. It is therefore, essential to examine the conventional definitions of the various methods and to identify any modifications in their applications in Hong Kong. Although the Offer by Tender method, used sparingly in the City of London, has never been applied in Hong Kong, it will be examined in principle.

Public Subscription

With a public subscription, the issuing company offers a number of shares inviting the public to subscribe for shares directly at a fixed price. Conditions of the invitation are contained in the prospectus as laid down by the Companies Ordinance and as required by the stock exchanges. Since 1972, the prospectus has to be issued in both Chinese and English. Over and above the governing provisions as contained in the Companies Ordinance, the company has to comply with quotation requirements as stipulated by the stock exchanges. These mainly

deal with documentation and disclosure of the financial conditions of the company. The cost of the issue is met by the company out of proceeds of issue. In the prospectus, related parties including the company's solicitor, accountant, bankers and underwriters are specifically disclosed. In many respects, this method of public subscription used in Hong Kong is very similar to the public offer method in England. One characteristic difference is that brokers acting as advisors to the issue are not used in Hong Kong. It is mainly the underwriters who perform the job of an issuing house, advising on pricing as well as underwriting. For these services, the underwriter receives a fee of about 2% as remuneration. If the application of the subscribing investor is lodged through a stock-broker, he gets 1% brokering commission. In short, any stock-broker will be entitled to the brokerage financially without having any direct involvement in the issue. Although stock exchanges require that the application of listing should be lodged by a member of the stock exchange, disclosure is not required in the prospectus. In the event of an over-subscription, an allotment of the new shares is scaled down according to some specific arrangement decided by the directors. If this arrangement involves drawings by lottery of individual names, a Notary Public is usually present when this is carried out.

Placement

In Hong Kong, placement refers to shares offered to the public handled by stock-brokers. This is different from the London jobbing system where placements cannot be made to brokers but rather to clients of the issuing house. The Hong Kong practice is similar to practices in the provincial stock exchanges where shares are placed with the brokers. As there are no regulations requiring a minimum proportion of a placement to be passed from the broker on to the public, Wong[1] considers this a weakness of the placement method, as clearly against the public interest. However, the London practice of acquiring shares from placement and then selling the shares at a premium to clients before the commencement of trading in the stock exchange would be infeasible in practice because of stamp duty. In Hong Kong since all transactions between the clients and stock-brokers have to be recorded on the stock exchange, no broker is allowed to transact before the official listing of a share. This is not only contrary to stock exchange regulations but also not permissible by the Inland Revenue Department for stamp duty collection purposes. If this practice is used, sales of shares can be made to an investor below the expected market price, thus reducing stamp duty revenue. Nevertheless, it is possible to have the shares taken up by clients when the placement applications open initially. Placement amounts should be at least 25% of the issued amount of equity capital whose percentage is similar to that of a public subscription. Subsequently, a guideline was drawn up by the Securities Advisory Council in 1973 in the form of an increasing percentage as the size of the company is smaller.

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1 Wong, K.A., op. cit. p.174.

Offer for Sale

An offer for sale refers to an issue offering shares to the public by a third party at a fixed price. It necessarily follows that the shares offered must be shares already issued and sold by a vendor. This vendor could be the existing owner of the shares or an intermediary for the owners. Thus, technically speaking, the share does not involve the introduction of new money to the prospective listing company. However, in practice, the adoption of this method may involve the creation of new shares for new money immediately before these shares are sold to the public through an intermediary or third party. With the general accepted practice of underwriting new offers, there is little difference between an offer for sale and the public issue. The only financial difference is that an offer for sale will at some time or other have involved stamp duty on both a buy and sell transaction other than the initial capital issuing stamp duty. In contrast to this, the public subscription method of offering new shares to the public involves only the stamp duty on the new issued capital and the investor pays no stamp duty. Hence, an offer for sale will incur a marginally higher cost of issue than a public issue. So it hinges on whether an issue is a new issue or not to differentiate costs between methods of issue - public subscription, placement and offer for sale.

In Hong Kong, an offer for sale is made directly by the owners to the public without going through an intermediary. In contrast to the City of London practice, shares are not sold to the issuing house but directly to the public. This means that on new issue prospectuses in Hong Kong, the term "Offer for Sale" is used to indicate the selling of existing shares to the public without raising new capital. For issues made to raise new capital, they are described as "New Issues". It must be stressed that this difference in practice distinguishes the definition of the term "Offer for Sale" in Hong Kong and London. Hence, it will be examined in the Hong Kong context when analysing the extent of new money raised in the market.

Introduction

Listing by stock exchange introduction has only been used once for a local company, Hutchison-Boag Ltd. The company is a subsidiary of Hutchison International Ltd. and is issued to the public for subscription by holders of Hutchison International shares. Similar to other issues, the offer is underwritten at its fixed offer price. Though similar to a rights offer, this listing contained the unique feature of a stock exchange introduction that no shares of the issue were offered to the public and the offer was restricted to existing shareholders of Hutchison International Ltd. Although this is the only local company listed by this method, some foreign companies have made use of this method for listing in Hong Kong such as Rolinco.

Tender

The tender method involves an offer to the public inviting bids to acquire the offer shares. It could take the form of an open tender with or without an indicated bid price[1] or it can be a controlled tender[2], modifying pricing by the tender method with the imposition of constraints over the final price determination. It is worth noting that this method of offering to the public without a fixed price has not been used at all in the market during 1970 - 1973. This may be due to the basic weakness inherent in an offer by tender. The sheer fact that all offers, regardless of whether it is a public subscription or a private placement, are underwritten at a stated fixed price may serve to indicate that the Hong Kong market is not yet prepared to accept the absence of a fixed price. To the listing company, it may serve the company better if the dollar amount to be received from the public offering is guaranteed by the underwriter. From a cashflow basis or future capital commitment basis, this appears superior to the uncertain amount subjected to the competitive bidding process.

To the potential investor, this method has the defect of an uncertain upset price and it requires the investor to exert judgement on the share even though he may not have the ability of evaluating a new issue.

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1 Merrett, op.cit., p.213

2 Wong, K.A., op.cit, p.268

Essentially, three methods of issue have been used in the period - placement, public subscription (by new issue or offer for sale) and stock exchange introduction. In addition, the Kowloon Stock Exchange has permitted listings to be made with a combination of the placement and public subscription for 16 companies from 1972 to 1973. Only one company used the introduction method for listing in 1970. The company, Hutchison-Boag, was placed to shareholders of Hutchison International Ltd. for subscription. Although the subscription right was distributed to shareholders of the parent company, the subscription price was underwritten by the issuing house and floated as a new issue. This differs from the conventional method of placement through stock-brokers and is listed by introduction.

TABLE 3.11 Method of Issue

Number of Listings 1970-1974 = 220

Method of Issue	1970	1971	1972	1973	1974	Total	Percentage of Total
Placement	12	6	68	45	-	131	59.6%
Public Subscription	11	4	17	39	1	72	32.7%
Stock Exchange Introduction	1	-	-	-	-	1	0.4%
Combined Placement/ Public Subscription	-	-	7	9	-	16	7.3%
TOTAL	24	10	92	93	1	220	100.0%

Table 3.11 shows that the placement method was used for 131 companies being 59.6% of the total 220 listings. The public subscription method was used for 72 companies, being 32.7% of the total numbers of issues. The combined placement and public subscription method was used to list 16 companies and the introduction method to list one company.

TABLE 3.12 Method of Issue

Value of Listing 1970 - 1974

(in Million $)

Method of Issue	1970 Value in HK$	1971 Value in HK$	1972 Value in HK$	1973 Value in HK$	1974 Value in HK$	Total (5 yrs.) Percentage
Placement	77	48	533	420	0	1,078 (29.39%)
Public Sub-scription	251	133	1,123	839	166	2,512 (68.50%)
Introduction	24	-	-	-	-	24 (0.66%)
Combined Placement/ Public Sub-scription	-	-	16	36	-	52 (1.45%)
TOTAL	352	181	1,672	1,295	166	3,666

As demonstrated in Table 3.12, the public subscription method constituted 68.5% with a value of $2,512 million from 1970 - 1974. The placement method was used for $1,078 million, being 29.4% of the market value. The combined method of placement and public subscription method and the introduction method accounted for only about 2% of the market value.

TABLE 3.13 Method of Issue

Average Value of Listings 1970 - 1974

	Nos. of Issue	Total Value of Issue (in $ MM)	Average Value of Issue (in $ MM)
Placement	131	1,078	8.2
Public Subscription	72	2,512	34.9
Introduction	1	24	24.0
Combined Placement/ Public Subscription	16	52	3.3
T O T A L	220	3,666	16.7

Table 3.13 gives the average value of listings in the period. The average value per listing by the public subscription method was $34.9 million but only $8.2 million by the placement method. When compared with the total average of $16.7 million, it can be observed that large companies were floated with the public subscription method whereas the placement method was applied to companies of fairly small size. The companies floated with a combined placement and public subscription method were the smallest among the four categories with an average value of only $3.3 million.

New Money Raised

Primarily, we distinguish the two methods of distributing a new listing by placement or public subscription. It is essential to analyse whether shares placed or offered to the public are new shares or the sale of existing shares. In Hong Kong, this is distinguished by the terms "New Issue" and "Offer for Sale". These two terms carry different meanings in literature of finance. Generally, new issue refers to issues made by company seeking a stock exchange quotation for the first time.[1] Offer for Sale refers to the issuing company or an owner of already issued shares selling the shares en bloc to an issuing house at an agreed price, who in turn sells it to the public.[2] Throughout this study, these two terms will be used in their universal meaning while the Hong Kong context of the two terms would be respectively called "New Shares" and "Sale of Existing Shares".

TABLE 3.14 Number of Listings with New Money 1970 - 1974

	No. of Issues	Percentage of Total
New Shares	146	66.3%
Sale of Existing Shares	58	26.4%
Combined New Shares and Sale of Existing Shares	16	7.3%
	220	100.0%

1 Merrett, op. cit. p.3.

2 Merrett, op. cit. p.6.

Of economic significance is the value of listings with new money. Table 3.15 shows that in the period, companies raised $2,559.8 million by issuing new shares to the public. This amount represents the flow of funds from investors to companies in equity capital. This amount can also be compared with the total value of rights issue in Table 3.2 amounting to $4,115 million in the period, being new capital additions to existing listed companies. This amount of $2,559.8 million of addition to new listings represents 69.8% of the total value of new listings. Sale of shares from existing shareholders to new investors amounted to $1,003.8 million, being 27.4% of the total value while the combined issue of new shares and sale of existing shares is only 2.8% of the total value of listings.

TABLE 3.15 Average Value of Listings with New Money 1970-1974

	No. of Issue	Value of Issue (in $ MM)	Average Value of Issue (in $ MM)
New Shares	146	2,559.8	17.5
Sale of Existing Shares	58	1,003.8	17.3
Combined New Shares and Sale of Existing Shares	16	102.4	6.4
	220	3,666.0	16.7

Table 3.15 illustrates the average value of listings raising new money. Examining the average value of listings, issues of new shares for new money average $17.5 million per issue. Listings by the sale of existing shares to new investors average $17.3 million per issue. These two average figures indicates that there is no size difference on the average value per issue. Relatively speaking, the combined new shares and sale of existing shares method is small with an average size of $6.4 million per issue.

Cost of Issue

The cost of issue consists of the underwriting commission paid to the underwriters and other costs such as legal fees, translators' fees, printing of prospectus, valuers remuneration and accountants fees. The cost should be of concern to the company as it is a disbursement from the proceeds of issue.

TABLE 3.16 Analysis of Underwriting Commission

	Value of Issue ($MM)	Value of Commission ($MM)	Commission as Percentage of Issue Value
1970	352.1	7.0	2.000%
1971	181.0	3.6	2.000%
1972	1,670.9	33.3	1.990%
1973	1,296.1	25.8	1.988%
1974	166.0	3.3	2,000%

It is the usual practice to charge 2% commission on the value of issue by underwriters, as in borne out by Table 3.16. One percent would be payable to sub-underwriters whose identity is not disclosed in the prospectus. Only 3 exceptions of 1% underwriting commission were charged in 1972 and 1973.

TABLE 3.17 Analysis of Cost of Issue

	Value of Issue ($ MM)	Total Cost ($ MM)	Total Cost as Percentage of Issue Value	Other Costs as Percentage of Issue Value
1970	352.1	17.2	4.88 %	2.88 %
1971	181.0	9.7	5.33 %	3.33 %
1972	1,670.9	69.8	4.17 %	2.18 %
1973	1,296.1	72.3	5.57 %	3.58 %
1974	166.0	5.1	3.07 %	1.07 %

Although underwriting commission is constant, other costs did fluctuate from 2.18% in 1972 to 3.58% in 1973, as shown in Table 3.17. The 1.07% in 1974 was because the only issue was that of the Cross Harbour Tunnel. It is worth noting that costs in 1971 and 1973 were high when compared with other years.

TABLE 3.18 Total Cost as Percentage of Issue Value 1970-1974

	2.5 - 4.9%	5.0 - 7.4%	7.5 - 9.9%	10% or More
1970	1	9	10	4
1971	-	6	2	2
1972	2	32	34	24
1973	3	31	29	30
1974	-	1	-	-
	6	79	75	60

Table 3.18 shows that the cost of issue is distributed quite evenly between 5 to 10% or more category. It appears that issues could seldom expect to pay less that 5% of cost from the net proceeds of issue. Nevertheless, between 1970 and 1971, costs range from 5 to 10%, but rarely exceeded 10%. However, in 1972 and 1973, more companies were willing to pay a cost exceeding 10% of cost. This is due to the boom in equity prices with companies trying to go public even at a high cost. Wong's analysis has revealed that surprisingly the average cost of public subscription is 4.18% but placement costs average 6%.[1] In contrast, placings in London between 1959 - 1963 cost 8.6% and 9.6% for public offers.[2] Wong attribute the Hong Kong findings to the portion of fixed costs. These costs, if averaged by public offers which are of a larger size, tend to give a lower average figure of costs.

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1 Wong, K.A., op.cit. p.214.

2 Merrett, op.cit. p.113.

Company History

Because of the vast number of private companies owned by individuals or families, it is not easy to determine the age of companies floated in the market. After all, most companies did not exist before the end of Second World War. Since 1946, the influx of population from China together with the growth of industries and trade have brought general prosperity to Hong Kong. It can then be assumed that most companies are less than 30 years old. Furthermore, because of the "personal touch" of companies, most flotations are made using a subsidiary company owned by the individual as a vehicle. This is particularly common for property owners who tend to hold different building sites under different limited companies to limit liability.

Notwithstanding the complications involved in clearly defining the exact life of the various assets in a company, the life of the company can be defined as the life of the public corporation, even though it may only be a vehicle before listing. This is considered reasonable as an owner would most likely float the company which has an established record of profit. Thus, the profit history can reflect the age of the company for comparison purpose. Alternatively, one can consider the date of registration. However, because of the provisional tax system then in existence, most companies are registered but remain idle for initial years to minimize tax. Hence, it will be more misleading to use just the period since registration to indicate company age.

TABLE 3.19 Number of New Listings by Age
Based on Profit Records 1970 - 1974

	1 Year	1-4 Years	5 Years	Total	Total Percentage
HKSE	5	20	20	45	20.45%
FEE, KNSE	25	22	53	100	45.45%
HKSE, FEE, KNSE	-	7	6	13	5.90%
FEE	-	6	3	9	4.10%
KSE	24	11	17	52	23.64%
HKSE, FEE	-	1	-	1	0.46%
	54(25%)	67(30%)	99(45%)	220	100.00%

Table 3.19 shows that out of the 220 companies floated, 99 companies have 5 years of reported profit, representing 45% of the total. 25% of the listings has less than one year of operating history. This higher than the 15% of companies going public for less than 1 year as revealed in the study by Vaughan and Associates between 1966 - 1974 on London flotations.[1] However, considering that Hong Kong has only a commercial history of less than 30 years, this does not appear to be unduly out of proportion.

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1 Vaughan, G.D., op.cit. p.23.

TABLE 3.20 Number of New Listings by Age Based on Profit Records on Individual Stock Exchanges 1970 - 1974

	1 Year	1 - 4 Years	5 Years	Total
FEE	25	36	62	123
	(20%)	(29%)	(51%)	(100%)
KNSE	25	29	59	113
	(22%)	(26%)	(52%)	(100%)
HKSE	5	28	26	59
	(8%)	(48%)	(44%)	(100%)
KSE	24	11	17	52
	(46%)	(21%)	(33%)	(100%)

From Table 3.20, Hong Kong Stock Exchange has only 8% of listings with less than a year of profit history. By contrast, Kowloon Stock Exchange has 46% of listings with less than a year of profit while the Far East and Kam Ngan are 20% and 22% respectively. Both Far East and Kam Ngan have a high percentage of flotations of at least five years of profit history while the Hong Kong Stock Exchange has 44%. Kowloon seems to have less listings with five years of history; only 33%. This can be attributed to the more recent establishment of the Kowloon Stock Exchange, with the result that it can only attract new companies, while the more established ones were listed on the other three exchanges.

Reporting Accountant Activities

In the period of study, a total of 39 accountants served as reporting accountants of issuing companies. For the total 220 issues, 18 issues were reported by two accountants jointly. This may be due to the need for the reporting accountant to work together with auditors of the company. Since there is no code of practice in Hong Kong requiring the reporting accountant to be independent of the auditors of the firm,[1] an account firm often acts both reporting accountant as well as auditors of the firm.

TABLE 3.21 Analysis of Reporting Accountants Activities 1970-1974

	Number of Reports	Percentage of Total
Lowe Bingham	40	16.8
M.W. Kwan	36	15.1
Peat Marwick	19	8.0
Cooper Brothers	13	5.5
L.G. Chung & Co.	12	5.0
Stephen Law & Co.	12	5.0
M.B. Lee & Co.	10	4.2
T. Le C. Kuen & Co.	10	4.2
Others	86	36.2
T O T A L	238	100.0%

1 Corbett, G., op.cit. p.67.

Table 3.21 shows that of the 238 numbers of reports on new issues by accountants, 152 were made by 8 firms, representing 63.8% of the market. Only 86, or 36.2% were shared among the 31 other accountants. Three of the 8 firms, Lowe Bingham, M.W. Kwan and Peat Marwick reported on 95 issuing companies, being about 40% of the total. As undoubtedly, there was concentration of work among these three accountants.

TABLE 3.22 Value of Companies handled by Reporting Accountants 1970 - 1974

	Value of Issue Sizes ($ MM)	Percentage of Total
Lowe Bingham	1.145	31.2%
M.S. Kwan	573	15.6%
Peat Marwick	905	24.7%
Cooper Brothers	185	5.0%
L.G. Chung & Co.	42	1.1%
Stephen Law & Co.	66	1.8%
M.B. Lee & Co.	148	4.1%
T. Le C. Kuen & Co.	102	2.8%
Others	921	13.7%
	4,087	100.0%

To analyze the role of the accountants, it is interesting to observe the value of issues handled by the major accountants. Table 3.22 indicates that the eight leading accountants handled over 85% of the total market value with Lowe Bingham alone taking 31%.

M.W. Kwan, although second in number of issues handled, reported on only 15% by value; but Peat Marwick which served only 19 issuing companies, covered 24.7% by value. This indicates that Peat Marwick reported mostly on companies of larger size.

TABLE 3.23 Analysis of Reporting Accountants

By Size of Company Listed 1970 - 1974

	No. of Reporting	Value of Issue Size (in $MM)	Average Value (in $MM)
Lowe Bingham	40	1,145	28.6
M.W. Kwan	36	573	15.9
Peat Marwick	19	905	47.6
Cooper Brothers	13	185	14.2
L.G. Chung & Co.	12	42	3.5
Stephen Law & Co.	12	66	5.5
M.B. Lee & Co.	10	148	14.8
T. Le C. Kuen & Co.	10	102	10.2
Others	86	921	10.7
	238	4,087	17.2

Table 3.23 illustrates that, Peat Marwick and Lowe Bingham have handled high average values of issue. M.W. Kwan, M.B. Lee and Cooper Brothers reported on about the average size of companies while two firms, L.G. Chung & Co. and Stephen Law & Co. handled relatively smaller issues among the eight leading firms.

Classification of Underwriters

During the period 1970 - 1974, a total of 53 underwriters participated in underwriting new issues. Of the 53, 23 were stockbrokers, finance houses or even trading companies. The remaining 30 were commercial banks or finance houses associated with commercial banks. Some, like Wardley Limited, are wholly-owned subsidiaries of banks while some, like Schroders & Chartered, are joint ventures between a bank and a London merchant bank. The 53 underwriters were involved in a total of 347 underwriting participations for the 220 new issues in the period, as shown in Table 3.24.

TABLE 3.24 Number of Participation by Year 1970-1974

	1970	1971	1972	1973	1974	Total
Underwriting participated by Non-Banks	12	8	29	48	5	102
Underwriting participated by Commercial Banks	26	15	112	90	2	245
TOTAL	38	23	141	138	7	347

Of the 347 participations, 101 were underwritten by non-banks and 245 by commercial banks or associated companies. On the whole, in 1970, 1971 and 1973 the ratio of participation by non-banks to banks was about 1 : 2. However, in 1972, the commercial banks were particularly active, resulting in a ratio of 1 : 4.

TABLE 3.25 Value and Number of Participations 1970-1974

	Number of Participations	Percentage of Total Number	Value of Issue (in $MM)	Percentage of Value
Underwritings handled by Non-Banks	102	29.1%	$ 904.1	24.7%
Underwritings handled by Commercial Banks	245	70.9%	$2,762.0	75.3%
TOTAL	347	100.0%	$3,666.1	100.0%

Although in terms of numbers of participations, non-banks took 29.1%, yet in percentage of total value, their share was only 24.7%, at $904.1 million as shown in Table 3.25. Underwritings handled by commercial banks numbered 245 or 70.9% but in value the amount was $2,762 million, or 75.3%.

In terms of average value, non-banks underwrote $8.95 per participation. For commercial banks, this average value was $11.2 million, so superficially they appear to have incurred more financial exposure; but it is reasonable to suppose that they exercised more prudence in their underwriting so that the risks they incurred were less. It is common practice for commercial banks in Hong Kong to act as issuing houses for new listings, underwriters bearing the financial risk and often as receiving bankers for the proceed of issue. In contrast, new listings in the City of London are rarely handled by commercial banks, but rather by merchant banks as issuing house. Underwriters may be insurance companies and investment houses while commercial banks act as receiving bankers.

CHAPTER IV

A FRAMEWORK OF ANALYZING THE PRICING DECISION

Literature on Pricing

In terms of long-term finance, Bischoff[1] and Mason[2] defined the roles of merchant bankers in acting as principal and agent while providing advice to companies in need of long-term funds. It follows that the pricing of a new listing is very important as it affects the underwriter's own investments as a principal and the use of managed funds as an agent. Newbould[3], upon discussion with issuing houses, considers that pricing of new listings is determined by a process of expertise and qualitative assessment. Baumol[4] maintains that highly volatile expectations cause stock prices to behave unsystematically, and hence, pricing a new flotation is likely to be difficult. Merret, Howe and Newbould[5] advance three methods suitable for pricing a new listing. This includes pricing on net asset per share basis, on a multiple of earnings as prevailing in the market and the tender method.

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1 Bischoff, W.F.W., Merchant Banking - The Concept Matures, op.cit.p.68

2 Mason, S., Merchant Banking Today and in the Future, Journal of Business Finance, Vol. 3, No. 4, 1971, p.8-9.

3. Newbould, G.D., On the Prediction of New Issue Prices, Journal of Economic Studies, Vol. 1, 1966, p.4.

4. Baumol, W.J., The Stock Market and Economic Efficiency, Fordham University Press, New York, 1965, p.48.

5. Merrett, op.cit. p.130.

Pricing on a net asset per share basis involves valuing the assets of a company, where historical costs are not adequate to reflect the current intrinsic value of a company. This then assumes a realisation value at the prevailing market price. Since the market price taken will be that of the assets, the effect of unrealistic pricing would be reduced with valuation of the physical assets done by independent professional valuers.

Using prevailing earnings multiple as an indicator to pricing may pose some difficulties. In a situation where stock exchanges are underdeveloped and at times where there is an unbelievable boom of stock exchange prices[1], pricing would become difficult. Where existing multiples become unrealistic the merchant banker will be faced with either giving up underwriting in a boom, underwriting issues at a price which it will not invest in itself, or issuing at a long-term price knowing that the price will go much higher in the short run. If prices subsequently fall below the initial issue price, the issuing house will have its reputation at stake. So, it is essential that some rational thinking or discipline be exercised to indicate to the less sophisticated investors a price level which the sophicated underwriter will invest in.

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1 Bischoff, W.F.W., A Revolution Gains Momentum, Far Eastern Economic Review, April 9, 1973, p.29.

The tender method has not been popular with the London issuing houses in new listings except with comparatively small issues of public utility stock,as issuing houses consider it their responsibility to indicate the prudent and resonable price to the public.[1] It will be difficult for the ordinary investor to bid for equity shares without any professional indication of price. Furthermore, a responsible issuing house does not like to overprice the issue for fear of initial market price trading below the flotation price. This will lead to a poor market for a long time after flotation. Hence, the tender method[2] has never been popular. The underwriter of the issue by taking up the financial risk of underwriting will help to assure the public of its confidence in the offer price being set at a fair level.

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1 Merrett, op.cit. p.130.

2 Sir Timothy Harford, Pricing a Flotation, Journal of Business Finance, Vol. 1, No. 1, 1969, p.19.

In examining the market discounts of new listings in Hong Kong for the period 1970 - 1973, Wong uncovered a considerable market discount which emerged between the issue price set by handling institution and the subsequent market price when dealings on the stock exchanges began. He failed to explain and identify the emergence of the "Equilibrium Market Discount", which is that part of the subsequent market discount which the issuing house should be responsible for, but he reckoned that the use of the controlled tender method will help to eliminate market discounts.[1] This method modifies the single bid - single price system. Although a discount is given based on certain market and company factors, bids above 10% of the clearance price would be allotted without any introductory discount to prevent stags submitting unrealistically high bids. Furthermore, high bidders would have delayed delivery of share certificates to prevent stagging. For an indication of price to the public, a minimum subscription price would be determined and underwritten by the issuing house.

While this may help to minimize discounts, this may not be popular among company officers who prefer to see share values go up after trading commences. Furthermore, there is reputation and prestige involved in an over-subscription with excitement generated by ballots. The public, having to bid for the shares, would be required to judge the clearance price, and would be penalised by delayed deliveries if their bids become "unrealistically high". Above all, to the issuing house, the pricing process of a new listing will not be eliminated by the controlled tender method as the minimum subscription price has

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1 Wong, K.A., op.cit. p.272.

to be determined by the issuing house. In so doing, the pricing process of considering relevant factors will remain the responsibility of underwriter. This also holds true for the first advocates of the controlled tender method, Merrett, Howe and Newbould,[1] whose method still requires the determination of a minimum subscription price. A strong case can still be made for a management tool to assist the underwriter in arriving at a reference price consistently.

Sir Timothy Harford[2] considered that for the purpose of price fixing, the valuation of a company is based on two factors. Firstly, the forecasted profit for the current financial year will have to be calculated and, secondly, a capitalization factor or price-earnings ratio[3] should be decided and applied to the forecasted profits. Arriving at a forecast profit figure is the primary responsibility of the Board of Directors, tested by the Company Accountants as to realistic assumptions underlying the calculation and finally scrutinized by the issuing houses. A contingency reduction of 7½% - 10% will be applied to the profit forecast to arrive at a prospectus forecast.

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1 Merrett, op.cit. p.228.

2 Sir Timothy Harford, op.cit. p.17.

3 See also Barlow, L.E., Earnings Ratios in Valuing Companies, The Canadian Cahrtered Accountant, Vol. 75, No.4, October, 1959.

The determination of the capitalization factor is considered the most difficult area which necessitates experience, judgement and luck. Sir Timothy identified two principal factors which affects the determination of the capitalization factor. One of these two factors is the assessment of past, present and future profit trends. Another factor is the consideration of prevailing price-earning ratios of other similar companies in the market. An alternative method of arriving at a capitalization ratio is to use a bench-mark price-earning ratio of 10 to 1 in judging market value of shares.[1] However, some analysts questioned the validity of this 10 to 1 ratio. The main contention is that nowadays, the managed economy helps to eliminate severe swings in business cycles and with improved management techniques, the risk element inherent in business has been moderated and thus, a higher price-earnings ratio is justified.

In considering the forecast of profits, the past performance is a good guide, but not infallible. The current state of the industry, the ability of company's management to operate in the future and the probable rate of growth all require knowledge, experience and intuition to assess.

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1 Barlow, L.E., op.cit.

Pricing with reference to similar companies in the market is also difficult. While it is rare to find a company which is exactly similar to the new listing, there are also specific differences between companies which superficially appear similar. All in all, Sir Timothy considered that the pricing process is extremely arbitrary while acknowledging some rational thinking in the analytical process. Besides the 10 to 1 ratio, Barlow suggested that money market conditions will also affect the valuation of a company.[1] In times of tight money with high returns on capital by investing in fixed income securities, it would be less attractive to the investor to invest in equity issues. As an inducement, a lower price-earnings ratio is needed to attract investments in new listings.

Some rules of thumb to gauge the marketability of securities were put forward by Beech.[2] These included the size of business, the market price-earnings ratio and an adequate amount of shares to be listed to give a distribution of sufficient coverage to permit orderly trading in an after-market. The relevance of the size of business was considered by Jaffray to cause difficulty for a small company to obtain funds economically but that the return on the proposed project might make the financing desirable, although the company may have a relatively new and perhaps erratic earnings record.[3]

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1 Barlow, L.E., op.cit.

2 Beech, J.W., op.cit.

3 Jaffrey, P., Raising Capital Funds, The Canadian Chartered Accountant, Vol. 90, No. 2, February 1967.

In evaluating stocks, the stockbroker interprets and weights information into an expert decision through a "mysterious, intuitive" process.[1] On the basis of 11 factors from Standard and Poor reports, Slovic demonstrated that it would be important to understand this process by simulating this decision process. He considered that this technique of decision simulation could provide the expert with new insight into his inferential processes. It was stated that it was difficult to ask the expert to describe his judgement process and then trying to fit all these together to emulate his judgement. Although this task is difficult,yet this is a common way in which expertise is communicated.[2] Considering the merchant banker as an expert, modelling the decision process will reveal how factors are weighted and combined by him, and hopefully, will help training persons to make better judgements.

Studying the portfolio-selection processes of a bank's trust-investment officer, Clarkson attempted to describe the complex decision making process.[3] First the investment officer was asked to "think aloud" when reviewing past and present decisions. The process was based on rules of thumb and was subsequently translated into a sequentially branching computer programme.

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1 Slovic, P., Analyzing the Expert Judge : A Descriptive Study of a Stockbroker's Decision Process, Journal of Applied Psychology, Vol. 53, No. 4, August 1969, p.255

2 Slovic, P., Analyzing the Expert Judge, op.cit. p.262.

3 Clarkson, G.P.E., Portfolio Selection : A Simulation of Trust Investment, Prentice Hall, 1962, p.28.

Using an essentially descriptive approach, Clarkson derived a mechanism which captured a considerable portion of the investment trust process. The essence of Clarkson's study lies in a sequential analysis of the expert's cognitions. Although not supported by quantitative data, the study aimed at analyzing "what is" rather than "what should be".[1]

Mathematical models were developed, typically by Hoffman[2], to predict the long-term price appreciation of stocks. These were based on identification of factors such as price-earnings ratios, yields and earnings, etc., using multiple correlation procedures to reveal how the stock market weighted these factors. Applying these factors to an individual analyst, a regression equation would reflect his personal weighting policy in predicting price movements of stocks. However, application of this technique to predict future stock prices will again involve estimating from an unstable sample universe, thus affecting the predictive power of the model. In general, psychologists have found linear models to be good predictors of judgements in fields of personnel, gambling and politics.[3]

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1 Clarkson, op.cit. p.103.

2 Hoffman, P.J., The Paramorphic Representation of Clinical Judgement, Psychological Bulletin, March 1960, p.119-121.

3 Slovic, P., Fleissner, D., & Bauman, W.S., Analyzing the Use of Information in Investment Decision Making : A Methodological Proposal, Journal of Business, Vol. 45, No. 2., April 1972, p.285.

However, in finance, its success was only in the development of a lending policy model of a particular bank, while prediction models for stock prices are subjected to the above-mentioned deficiencies. In contrast to the subjective methods of prediction, which was based on a state of mind, Slovic considered that scientific or statistical modelling was gaining popularity,[1] taking into consideration both theorectically derived or empirically-determined quantitative relationship to arrive at a set of decision rules.

Nonetheless, it is clear that each time an issue is being underwritten, the reputation of the issuing house is at stake. There should certainly be consistency and logic inherent in the pricing decision.[2] An attempt to reconstruct and validate this process will provide a better insight for future improvements. Bauman argued that by expressing the decision variables of the investment analyst, the decision process could be observed, evaluated and tested.[3] Clarkson considered that modelling the decision process could help to discover inconsistencies in the process and improve techniques used.[4] Simulation would also help to identify institutional constraints imposed upon the decision maker. Hence, this could lead to procedural changes or changes in the constraints for the improvement of the pricing system.

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1 Slovic, P., Psychological Study of Human Judgement : Implications for Investment Decision Making, Journal of Finance, Vol. 27, No. 4, September, 1972, p.780.

2 Beech, J.W., op.cit.

3. Bauman, W.S. Scientific Investment Analysis, Financial Analysts Journal, 1967, p.93-97.

4 Clarkson, op.cit. p.103.

Selection of Approach

The initial difficulty of constructing a pricing model for an underwriter is the selection of variables for evaluating a company which has no market price history. Any misconstruction of the model will lead to significant lack of explanatory power rendering it non-predictive. Since underwriters differ in capability and expertise, the construction of the model should be based on the pricing behaviour of an individual underwriter. Construction of one model for all underwriters, such as the Davis and Yeoman study will introduce unstable parameters into the model. Such model specification will result in low explanatory power because individual differences of underwriters are not incorporated. Considering differences in pricing behaviour, issuing houses can assume three alternative time criteria in their individual model construction:-

(1) A short-term view, pricing the new issue according to the immediate outlook of the market.

(2) A long-term view will enable issuing houses to incorporate the intrinsic value of the firm to be reflected in the setting of the price.

(3) A combination of both the long-term and the short-term view.

It is usually in the best interest of the listing company or the vendors of the shares to price the offer as close to the market as possible. When market conditions are favourable, it may be possible to price the offer in excess of its net asset value. When the market conditions are less favourable, this excess will be smaller and may even become a short fall, so the issue may simply be suspended pending a more favourable date. Under such circumstances, the new issue will only be made when market conditions are favourable. On the other hand, stock exchanges will not permit excessive pricing when granting permission for listing. This serves as a safeguard against possible over pricing.

However, an issuing house will be more concerned that the issue is completely taken up within a short interval of time. A longer period of distribution than needed will increase the underwriters' costs of inventory holding, investor search and post-offering price stabilization, thus increasing the probability of loss.[1] Hence, it is in the interest of the issuing house to incorporate an introductory discount to expedite the distribution of the issue, and to protect joint underwriters' interest. This enables the issuing house to obtain continued future support from other underwriters in joint-underwritings.

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1 Logue, D.E., op.cit. p.203.

Furthermore, institutional restrictions, such as that exercised by the Securities Exchange Commission and the listing stock exchange authorities will act as a counter-force against excessive over-pricing. Thus the vending company, the regulating bodies and the issuing house will act as counter-balancing forces in the pricing decision.

The use of the first criterion (i.e. the short-term view) may be the best to the vendors but it will be subjected to the instabilities of the market. Testing for relationship among explanatory variables will be difficult as demonstrated by previous studies. If we assume that the issuing houses underwent extremely complicated evaluations of the market before pricing, such complications, veiled in the dynamics of the market, will result in difficulties in identifying any consistent process of pricing, besides market factors.

The application of the second criterion in the pricing process will mean perhaps a simplified approach. Nevertheless, it permits a systematic approach for more consistent valuations. By valuing a company in terms of its intrinsic values, including variables like net assets, earnings potential, dividend payout and loan gearings, this will make the valuation process more quantifiable for decision-making.

The third criterion appears most logical in the pricing process. It is the combination of the above-mentioned criteria. The most likely order of application is that the issuing house

will initiate the pricing decision with the long-term fundamental approach, and subsequently adding in predictions of the short-term market to complete the process. However, the net outcome of the two approaches really depend on the weighting attached by the underwriter in the process. Dominance of the short-term outlook should result in different evaluations for basically similar firms under different market conditions. A high weighting for the long-term factor should give rise to a fairly consistent price for companies of the same class with only minor modifications.

It is the primary aim when testing market discounts to determine the efficiencies of underwriters with a view to improving the process of underwriting which may eventually lead to a more efficient capital market. With the high volatility of stock prices, during 1970 - 1974, it appears that there were many factors affecting the market prices which cannot be isolated and studied. It is therefore more appropriate in the context of Hong Kong to study the respective significance an underwriter attaches to the long-term and the short-term approach, in formulating the basis of pricing. This basis, once identified, will permit a better insight into the pricing process before studying the emergence of the subsequent market discount. To a great extent, less efficient underwriters will be able to compare their pricing methods, recognize their internal constraints, be they financial or managerial, which prevents them from setting the price at a level comparable with that of efficient underwriters. The development of such a tool will help to improve the efficiency of the market by pricing new issues more consistently and also provide a basis in explaining the background pertaining to different pricng decisions.

Hypothesis

The pricing of a new listing is indicated by the expected price-earnings ratio (PE) as indicated in the new issue prospectus. Although earnings may be affected by various accounting methods, it is assumed that this would remain constant because of consistent accounting practices. This assumption is valid since all applications for new listings are scruntinized by the relevant stock exchange committees. In three of the four stock exchanges, some professional accountants serve as members of the committee. For the one which has no accountant serving on this committee, comments from an independent accountant firm are invited before the application is considered.

$$PE = \frac{P}{E}$$

where P is the offered price of a share and
E the earnings per share.

Our previous discussion on the three approaches of pricing indicated that a combination of both long-term and short-term view is more appropriate for model construction. The expected price-earnings ratio (PE) may have the following functional relationship:-

$$PE = f(p) + g(q)$$

where $f(p)$ is a systematic function which is based on the long-term valuation of a new issue.

and $g(q)$ is a function more susceptible to random influences which is dominated by the short-term outlook of the market.

Methodology

Phase I - Initial Case Studies

The study was initiated by the examination of two cases, Kar Yau Company Limited and Kien Shing Development Company Ltd. to uncover the process of listing. In the Kar Yau Company case, emphasis is placed on the procedural aspect of listing and the identification of decision-makers. The procedural aspect included the documentation required as well as the timing and required procedures. Findings from this case study is summarised in Exhibit A, Documents for Listing and Exhibit B, Procedures of Listing. Because of the confidential nature of case materials, these exhibits are generalised to reflect the complicated task of coordination prior to listing a new issue.

The case study of the listing of Kien Shing Development Company Limited attempts to focus on the complexity of property costing which may affect the pricing decision. Here, the role of the reporting accountant is identified in the pricing process. A hypothetical example of the reporting accountant's work is shown in Exhibit C which shows a sample Profit Forecast (Exhibit C-1), and an illustrative Balance Sheet (Exhibit C-2). These two reports are the major sources of financial information in the new issue prospectus. Although the reporting accountant would have assisted in the preparation of both reports, he only certifies the audited balance sheet. The profit

forecast is presented by the Board of Directors which may state certain assumptions in the prospectus when necessary. In Exhibit D, two hypothetical profit estimates for two proposed building sites are shown. These estimates may be prepared by management with advice from professional property valuers. Exhibit D-1 shows a profit forecast for estimated construction costs and sales revenue for a residential building. Exhibit D-2 shows the profit forecast for a building combined commercial and residential uses.

Phase II - Collection of Data

Basic financial data were extracted from company new issue prospectuses. Analysis of data was used to first identify more active underwriters and form the basis of subsequent interviews. It is important to select underwriters which has a high value of underwriting and a fair number of issues handled to give a sufficient sample base for study. Other data were collected from publications of stock exchanges, Hang Seng Bank, Census and Statistics Department, Hong Kong Government Gazettes, the HANSARD and the Hong Kong Economic Journal.

Phase III - In-Depth Interviews

In-depth interviews were conducted among major underwriters, selected from data analysis in Phase II. Furthermore, stock exchange officials, company officers and reporting accountants were interviewed. These decision-makers helped to select variables to be incorporated in the construction of the pricing model. They also provide further background to the pricing process of a new issue. In addition, these interviews served to reveal some special features of the market. Further data collection was indicated following these interviews.

Phase IV - Construction of the Prediction Model

The pricing model will be constructed with the estimation of a regression equation for the leading issuing houses and stock exchanges. Variables, which are suggested by the decision-makers to influence the pricing process, are identified in Phase III, through interviews with major underwriters, reporting accountants, company officers and stock exchange officials.

Statistical analysis of the model will be conducted by step-wise regression to identify multi-collinearities between the ~~dependent and~~ independent variables using the ICL Statistical Analysis Mark 2 1900 Series : Subprogramme Multiple Regression Analysis. The dependent variable will be the forecasted

price-earnings ratio as forecasted in the prospectus for the first year after listing. Independent variables are those suggested by decision-makers, consisting of both long-term valuation variables and short-term market condition variables. Log transformations will be performed on the variables to test for a better fit. The final pricing model will be constructed by least square analysis, based on estimates of a multiple regression equation. Thus, a set of models can be generated for issuing houses and stock exchanges.

$$\log P/E = \alpha + \sum_{i=1}^{n} \beta_i \log x_i + \epsilon$$

Where x_i represents the variables identified through interviews with decision-makers.

and ϵ is the residual error.

For each coefficient, β, there will be a corresponding level of statistical significance. In this study, results which are better than 5%, that is a one in 20 chance of the observed correlation being zero, will be defined as significant.

In constructing a pricing model for an underwriter, it may be preferable to include only samples which are wholly underwritten or which the underwriter acts as a lead manager only. However, this would greatly reduce the number of observations for the model construction. It is unreasonable to assume that joint-underwriters have no influence on the pricing at all, but it is

fair to assume that regardless of their own way of pricing, they should also agree to the pricing of the issue since they are financially committed in the issue. In the event that pricing deviations appear in the joint-underwriter's pricing model, this will be reflected in a larger residual on the observation. By residual analysis and subsequent discussions with the underwriter concerned, pricing differences between underwriters can be identified.

Samples based on new listings underwritten by an underwriter in the period 1970 - 1973 will be divided into two groups based on weightings of industrial classifications to ensure industrial coverage. After the data division, the samples will be selected on a time serial basis with subsequent samples for model testing. One group is used for the model construction and the other, the hold-out data, for validating the model.

An alternative method of constructing a price prediction model will be to include all available pricing observations by an underwriter in the regression analysis. This will undoubtedly increase the sample size in constructing the model. Yet if the model is to be considered for prediction purposes, subsequent observations should be available to test the model. However, between 1974 - 1976, there was only one new listing. Thus, the subsequent sample size is too small for the purpose. Of course, one can use this method of model construction under the

assumption that future prices can be predicted by this model. Hence, this method of including all observations in the model construct will also be considered in Appendix I and the results of the two approaches will be examined.

Phase V - Validation of the Prediction Model

The prediction model constructed will take the form of a pricing equation of :-

$$\text{Log (P/E)} = \hat{\alpha} + \hat{\beta}_1 \log x_1 + \hat{\beta}_2 \log x_2 + \ldots\ldots\ldots + \hat{\beta}_7 V + \epsilon^R$$

where ϵ^R is the error of the prediction equation

and $\epsilon_R \sim N(0, \sigma^2)$

The testing samples in the hold-out data, with their respective independent variables $x_1, x_2, x_3, \ldots\ldots x_n$, U, V, will obey the above equation if the model is consistently used over time. In other words, the observed $\log (P/E)_i$ of the hold-out data should obey the following equation :-

$$\log (P/E)_i - (\hat{\alpha} + \hat{\beta}_1 \log x_1 + \hat{\beta}_2 \log x_2 + \ldots\ldots + \hat{\beta}_6 V + \hat{\beta}_7 V)$$

$$= \log (P/E)_i - \widehat{\log (P/E)}_i = \epsilon^V_i$$

where ϵ^V_i is the error between the observed log P/E and predicted $\widehat{\log\ P/E}$ from the hold-out data.

We therefore need to test that whether $\epsilon^V_i \sim N(0, \sigma^2)$.

This involves three tests of hypotheses:-

(1) ϵ^V assume a normal distribution.

(2) Variance from validation $(\sigma^2)^V$ is equal to the variance from the prediction model, $(\sigma^2)^R$.

(3) ϵ^V_i assumes a zero mean, i.e. $\bar{\epsilon}^V = 0$.

If these three tests indicate the acceptance of the three hypotheses, it can be concluded that the validation is unbiased where distribution is normal with the same variance as the prediction model. It is worth noting that tests (2) and (3) depend on the assumption that the residual ϵ^v assumes a normal distribution. Only the largest issuing house, Wardley has a large enough sample for testing normal distribution and those for the stock exchanges will be calculated accordingly. As regards the other eight leading houses, it is assumed that they have the same type of distribution.

Test for Hypothesis (1)

To test whether the error of the validation, ϵ^v, has a normal distribution, the Kolmogorov - Smirnov Test is used to cope with the situation of sampling from a normal population with unknown mean and variance.

The validation sample size is n with errors $\epsilon^v_1 \leq \epsilon^v_2 \leq \cdots \leq \epsilon^v_n$

compute $$\bar{\epsilon}^v = \frac{1}{n} \sum_{i=1}^{n} \epsilon^v_i$$

$$(\sigma^2)^v = \frac{1}{n-1} \sum_{i=1}^{n} (\epsilon^v_i - \bar{\epsilon}^v)^2$$

The Kolmogorov - Smirnov statistic is calculated by [1],

$$d_n = \underset{1 \leq i \leq n}{\text{supremum}} \left[\left| \frac{i}{n} - \Phi\left(\frac{\epsilon^v_i - \bar{\epsilon}^v}{\sigma^v} \right) \right|, \left| \frac{i-1}{n} - \Phi\left(\frac{\epsilon^v_i - \bar{\epsilon}^v}{\sigma^v} \right) \right| \right]$$

where Φ is the cumulative standardized normal function.

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1 Pearson, E.S. & Hastley, H.O., Biometrika Tables for Statisticians, Vol. II, Cambridge University Press, 1972, p.117-118.

The d_n statistic need to be modified by the factor $(\sqrt{n} - 0.01 + \frac{0.85}{\sqrt{n}})$ to correct for the parameters of the normal being estimated.[1]

Thus, $d_n^* = d_n \left(\sqrt{n} - 0.01 + \frac{0.85}{\sqrt{n}} \right)$

The critical region for an approximate large sample test is $d_n^* > 0.895$. Hence, we shall reject the hypothesis if d_n^* is greater than 0.895.

Test for Hypothesis (2)

From the prediction model, the residual error ϵ^R has a variance of $(\sigma^2)^R$. It is therefore necessary to test whether the error from validation ϵ^v has the same variance as ϵ^R from the prediction model.

Therefore, we wish to test,

$H_o : (\sigma^2) = (\sigma^2)^R$

$H_1 : (\sigma^2) \neq (\sigma^2)^R$

where $(\sigma^2)^v$ is the variance of validation,

and $(\sigma^2)^R$, the variance of the prediction model.

Using a F-Test, we wish to test the statistic,

$$\frac{(\sigma^2)}{(\sigma^2)^R} \approx F_{n-1, N-K}$$

where $n - 1$ is the degrees of freedom of the validation,

and $N - K$ is the degrees of freedom of the prediction model.

This will be tested against a critical value of $\alpha = 0.05$ If the value exceeds the α - level as determined from a F-Distribution, the model will be rejected.

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1 Pearson, op.cit. p.359

Test for Hypothesis (3)

To consider whether the error of the validation, ϵ^V, has a zero mean, we are interested to test whether the equation is an unbiased estimator.

Hence, we wish to test, $H_o : (\bar{\epsilon})^V = 0$

$H_i : (\bar{\epsilon})^V \neq 0$

Applying a T-Test, the T-Statistic is tested by,

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} \approx t_{n-1}$$

where $(\bar{\epsilon})^V$ is the mean of the residual error of the validation,

$(\sigma^2)^V$, the variance of the validation,

and n, the number of observations in the validation.

A significance level of 0.05 is used. If the T-Statistic is less than this level, the hypothesis that $(\bar{\epsilon})^V = 0$ will be accepted.

Data Base

The sources of data for the construction of the pricing model were the company prospectuses, stock exchange daily price listings, the Hang Seng and the Far East Index, fixed deposit interest rates. These were obtained from the research units of the stock exchanges and the Hang Seng Bank. In this respect, all four stock exchanges were most helpful, resulting in a collection of 220 issues, which is a comprehensive study of the period. It is worth noting that Wong's study on market discount comprised only of 144 samples, which represented only partial coverage of the market.[1] Industrial classifications are based on the classification in the Hong Kong Economic Journal.

The 220 issues included all new listings in the period, 1970 - 1974. New listings are defined as those companies where shares have been made available to the public during this time. The study focuses on pricing by underwriters of the shares of companies which had no existing market price. Thus, issues of new shares by existing listed companies, either by rights or placements, are excluded. While individual issues may be excluded from the pricing model because of the inadequacy of the data, the following samples are eliminated because of their nature.

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1 Wong, K.A., op. cit., p.189

One company, Hutchison Properties Limited is excluded because it was listed by distributing the shares to holders of A.S. Watson Limited, the parent company, as an interim dividend. In this case, no public money was subscribed for the share and there was no underwriter for the purpose of pricing.

Investment companies totalling 19 in the period are also excluded since they do not generally provide a profit forecast. Even when provided, the forecasted price-earnings ratio is very much dependent on expected future market conditions and the portfolio management capability of the firm. These factors cannot be reflected by a study of this kind.

In this period, Cross Harbour Tunnel Limited, the one and only utility company was listed in July 1974 and was in fact the only company listed in 1974. Because of the limited base, it is felt that incorporating this issue would not improve the model sufficiently for better prediction of utility companies. Nevertheless, the model constructed may be used for pricing utility companies under appropriate assumptions.

Underwriters, such as Wardley and The Hong Kong & Shanghai Bank; Jardine Matheson and Jardine Fleming; Hang Seng Bank and Hang Seng Finance Limited; the Chartered Bank and Schroders & Chartered are considered jointly together as they are either subsidiaries or associate companies. Methodologically, this will increase the sample size for each model construction.

Identification of Active Issuing Houses

In the period 1970 - 1974, new listings totalled 220 in number. Listings are either solely underwritten by one underwriter or jointly underwritten by several merchant bankers, each specifying its extent of participation in the new issue prospectus. The aggregate number of participations by all underwriters was 347, from which a percentage of participations can be derived. Table 4 sets out the activities of the leading underwriters.

The total amount of new money raised was $3,666,143,271 in this period. The value of underwriting by each underwriter was ascertained from the prospectuses and is believed to be a good measure to reflect the relative importance of underwriters. In this respect, Wardley emerges as the largest underwriter participating in 68 issues with a total value of $1,233,138,233, capturing a market share of 33.64% with the second largest, Jardine Fleming, getting 11.42% of the market. Other more important underwriters are shown in the table following.

TABLE 4.1 Activities of the Leading Underwriters 1970-1974

	Value of Underwriting	Market Share (%)	No. of Participations	Percentage Participation in the Total 220 Issues
Wardley	$1,223,138,233	33.64	68	30.91
Jardine Fleming	$ 418,704,250	11.42	31	14.09
Schroders & Chartered	$ 271,363,625	7.40	22	10.00
Hang Seng Bank	$ 260,187,500	7.10	24	10.91
Oriental Financial Consultants	$ 119,050,000	3.25	29	13.18
Union Bank	$ 88,874,000	2.42	17	7.73
Hang Lung Bank	$ 93,459,000	2.55	16	7.27
Overseas Trust Bank	$ 88,905,000	2.43	16	7.27
Bangkok Bank	$ 132,988,750	3.63	13	5.91
Others	$ 959,472,913	26.16	111	50.00
T O T A L	$3,666,143,271	100.00%	347	

The selection of the nine larger merchant bankers is based on two criteria. The first criterion is the value of the underwriting in which individual houses have participated. This is indicative of the financial capability of the merchant banker in its exposure to financial risk. The second criterion is the frequency of participating in new issues given by the number of participations. The frequency of participation is important to broaden the sample base for the construction of pricing models. Even if a merchant banker is significant in the value of new issues it has underwritten, a small number of participations will render the pricing model less predictive. Hence, merchant bankers with fewer participations than 13 are not included. It is worth noting that other than the 9 major issuing houses, a total of 41 underwriters each with a market share of not more than 3%, constitute the remaining 26.16% in terms of value of the market.

TABLE 4.2 Average Value of Underwriting by Issuing Houses 1970 - 1974

	Value of Underwriting (in Million $)	No. of Participation	Average Value Per Participation (in Million $)
Wardley	1,233	68	18.1
Jardine Fleming	419	31	13.5
Schroders & Chartered	271	22	12.3
Hang Seng	260	24	10.8
Oriental Financial Consultants	119	29	4.1
Union Bank	89	17	5.2
Hang Lung Bank	93	16	5.8
Overseas Trust Bank	89	16	5.6
Bangkok Bank	133	13	10.2
Others	960	111	8.6
	3,666	347	10.6

Table 4.2 shows the activities of the nine leading issuing houses in terms of average value per participation. Of the nine merchant bankers, four have an average value per participation above the market average of HK$10.6 million. These four, namely Wardley, Jardine Fleming, Schroders & Chartered, and Hang Seng Bank can be defined as major issuing houses. The other five, namely Oriental Financial Consultants, Union Bank, Hang Lung Bank, Overseas Trust Bank, and Bangkok Bank can be defined as smaller issuing houses.

Pricing models for the individual houses will be constructed based on this grouping in order to identify their pricing decisions. Thus, models for issuing houses can be termed "decision models". Pricing models for the four stock exchanges will also be constructed to identify their different pricing requirements. Conceptually, these pricing requirements can be considered as constraints exerted by the stock exchanges in admitting new issues for listings. Thus, the issuing company has to meet pricing requirements of the stock exchange to which it applies for admission. Since the pricing of new issues is primarily determined by issuing houses, pricing models based on individual stock exchanges can be constructed as "evaluation models" to identify different pricing requirements unique to individual stock exchanges.

Model Specification

Interviews with decison-makers in the pricing process were conducted first with an open-ended question asking the respondent to suggest variables of new issue pricing. The technical process of listing and associated matters of interest are examined. The interviews were concluded with specific questions suggesting financial ratios to be considered. The interviews are summarized in the Table 4.3.

The summary of interviews reveals a total of thirteen items. Of these, factor (10) - underwriters prefer a higher or lower price; factor (8) - management is an important factor; and factor (9) - financial ratios are not important in pricing cannot be quantified. Factor (12) - pricing different between distribution methods and factor (13) - the rating of companies were comments made by only 2 interviewees nad so are considered not significant. Factor (11) - stock exchanges as pricing constraints will be examined on the basis of residuals arising from the analysis.

Two variables, historical profit variability (6) and stability of future income (7) pose data problems. Historical profit variability was not uniformly reported since many companies used a former subsidiary as a vehicle for listing. As no consolidated accounts were required then, reporting was not standardized. This was quite common in company prospectuses.

Incomplete data also posed problems for stability of future income. This was not reported in all company reports, and one also has to recognize the difficulty in defining recurrent income. Even for a recurrent item such as rent, there are other factors such as varying length of the lease etc. Hence, these two variables are dropped from the model construction because of the lack of uniform and quantitative data. Thus, seven variables are selected from the interviews (counting market conditions as two) and the pricing model takes the form of:-

$$\log P/E_i = \alpha + \beta_1 \log x_1 + \beta_2 \log x_2 + \beta_3 \log x_3 + \beta_4 \log x_4 + \beta_5 \log x_5 + \beta_6 U + \beta_7 V + \epsilon$$

where $\beta_1, \beta_2 \ldots\ldots\ldots \beta_7$ are regression coefficients,

and P/E is the price-earning ratio.

x_1 Mix of assets (ASMIX)

x_2 Net asset per share (NASPS)

x_3 Size of Company (TASS)

x_4 Dividend cover (DCOV)

x_5 The Market Interest Rate (INT)

U The volatility variable into high volatile and low volatile state, dummy (VOLAT)

V The short-term market trend variable as determined by trend analysis, dummy (TREND)

ϵ The error term.

$x_1, x_2 \ldots\ldots x_5$ can be identified as long-term valuation variables while U and V reflect the short-term market outlook. Thus, this model conforms to the hypothesis that both long-term valuation variables and short-term market condition variables should be included in the model specification.

TABLE 4.3 Summary of Interviews with Decision-Makers on Pricing of New Issues

Pricing Factors Mentioned / Decision-Makers Interviewed	(1) Asset Value	(2) Size of Company	(3) Dividend Cover	(4) Market Interest Rate	(5) Market Conditions	(6) Profit (Past) Variability	(7) Stability of Future Income	(8) Management	(9) Financial Ratio No Effect on Pricing	(10) Underwriter Favour Higher Price	(11) Stock Exchange as a Constraint	(12) Pricing No Difference between Public Subscription & Private Placement	(13) Rating of Companies
Underwriter 1	✓		Less Important		✓	✓	✓	✓	✓	No		✓	✓
Underwriter 2	✓	✓			✓	✓	✓	✓	Some Industries Useful	No	✓	✓	
Underwriter 3	✓	✓			✓	✓	✓	✓		✓	✓		
Underwriter 4	✓		✓	✓	✓	✓	✓	✓	✓		✓		
Underwriter 5	✓	✓		✓			✓	✓	Some Industries Useful				
Underwriter 6	✓					✓		✓					
Underwriter 7	✓				✓	✓		✓	✓				

TABLE 4.3 Summary of Interviews with Decision-Makers on Pricing of New Issues (Cont'd)

Pricing Factors Mentioned / Decision-Makers Interviewed	(1) Asset Value	(2) Size of Company	(3) Dividend Cover	(4) Market Interest Rate	(5) Market Conditions	(6) Profit (Past) Variability	(7) Stability of Future Income	(8) Management	(9) Financial Ratio No Effect on Pricing	(10) Underwriter Favour HIgher Price	(11) Stock Exchange as a Constraint	(12) Pricing No Difference between Public Subscription & Private Placement	(13) Rating of Companies
Stock Exchange 1	✓	✓			✓		✓	✓					
Stock Exchange 2	✓	✓	✓	✓		✓	✓	✓	✓				
Stock Exchange 3	✓	✓		No		✓	✓	✓		No			
Accountant 1		No			✓		✓	✓					
Accountant 2		✓		✓	✓		✓		✓				
Accountant 3	✓												
Issuing Company 1	✓				✓			✓	✓				
Issuing Company 2	✓							✓					
No. of Times Mentioned	13	7	3	4	9	8	10	13	6	1	3	2	1
Section of Variables	S	S	S	S	S	R-3	R-3	R-2	R-2	R-2	R-2*	R-1	R-1

R-1 Responses too limited in number for consideration.
R-2 Factors that cannot be quantified.
R-3 Incomplete data.

S - Variables selected.
R - Variables rejected
* Although rejected, will be analysed in later section.

Definition of Variables

(a) The variables as suggested by major underwriters and stock exchange officials are taken from the new issue prospectuses. The dependent variable is taken as the price-earnings ratio as forecast for the first year after listing.

(b) Mix of assets is given by the ratio of current assets to net tangible assets of the company. This reflects the current asset content of the company. Although intangibles play an important part in the valuation of a company, their valuations are subjected to a wide margin of discretion unlike tangibles which can be gauged in the light of market forces that any quantitative estimate of value lacks acceptable precision.

(c) Net asset per share is given by the net asset value given in the prospectus divided by the number of shares outstanding after flotation. This reflects the realisation value of the firm at the time of listing.

(d) Size of company is based on the total assets of the company as revealed in the prospectus of issue. This figure is the sum of net tangible assets, current liability and deferred liability. This indicates the size of the company taking into consideration of the borrowing capacity of the firm as well as its net assets.

(e) Divided cover or the retentions ratio is the multiple of forecasted profits over the forecasted dividend payout. This multiple is an indication of the dividend policy determined by management taking into consideration the future cashflow positions of the company.

(f) Market interest rate is given by the one year fixed deposit rate determined by the Exchange Bank Association for Category One Bank, which are the first-class banks in Hong Kong. This is supplied by courtesy of Hang Seng Bank Limited. Here the market interest rate is taken at the date of prospectus. This assumes that the pricing decision is made as of the date of prospectus, which may be later than the actual date of price setting. Technically this should be a date before a board meeting is held to approve the prospectus. This may involve a period of about 10 days before the date of prospectus. However, this difference of time varies between underwriters or companies and is difficult to identify specifically. Nevertheless, in view of the infrequent fluctuation of interest rates, the market interest rate is taken at the date of prospectus.

From 1970 to 1972, this rate remained fairly stable, but it started to fluctuate after March 1, 1973, rising with world interest trends. Table 4.4 shows the actual fluctuation of this rate.

TABLE 4.4 Deposit Interest Rates of Hong Kong Category 1 Banks

Effective Date	1 Year Fixed Deposits
1968	
July 1	6-1/4
1971	
April 28	5-1/4
October 11	4-7/8
1973	
March 1	5-5/8
June 14	6-1/2
August 1	6-3/4
August 17	7
September 1	7
September 10	8
1974	
July 4	9
July 16	10-1/4

It would also be worthwhile to study the number of issues floated at various prevailing interest rates. Since only one company, i.e. Cross Harbour Tunnel, made an issue in 1974, hence forth the study will be focused on 1970 - 1973.

TABLE 4.5 Distribution of Flotations at various Interest Rate

Interest Rate	No. of Flotations	Percentage
4.875	171	78.08
5.25	5	2.28
5.625	12	5.48
6.25	26	11.87
6.75	1	0.46
7.0	1	0.46
8.0	3	1.37
TOTAL	219	100.00%

As shown in Table 4.5, the majority, 78% of the new issues, were floated when the interest rate was lowest, i.e. 4.875% per annum. With low interest rates, i.e. lower alternative opportunity rate of return to the investor, new equity issues can compete more favourably with banks for investment funds, thus accounting for the larger number of flotations. It should also be noted that the 4.875% interest rate was stable from October 1971 to the end of Fabruary 1973. This stability was reflected in the money market, and encouraged stock market activity. In contrast, when interest rates started to fluctuate after March 1, 1973, the uncertainty in the money market was probably a partial cause of the reduction in the number of issues.

(g) The market condition is identified on an actual basis and is defined to consist of two variables, namely a volatility variable (U) and a trend variable (V). Each variable consists of two states. The trend can be in an upward or a downward state and volatility can be high or low. These two variables will be incorporated into the pricing equation as dummy variables.

(i) The trend is established by observation of the time series of Hang Seng Index daily changes from 1970 to 1973, shown in Figure 4.1, identifying high and low points of the Index. The existence of a trend is recognized by definition of the Dow Theory. The Dow Theory defined market movements by the Dow-Jones averages. Three trends are identified, namely, the Primary Trend, the Secondary Trend and the Minor Trend.[1]

The Primary Trend is the long-term movement of a market with bull or bear market conditons. It may last for years. The Secondary Trend interrupts the Primary Trend and is an intermediate movement. It lasts from three weeks to several months. Minor Trends are brief fluctuations in a Secondary Trend and are considered unimportant individually.[2]

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1 Magee, J., Technical Analysis of Stock Trends, 5th ed. John Magee, Springfield, Mass., 1973, p.13-15.

2 Stansbury, C.B., The Dow Theory Explained, Richard Russell Associates, New York, 1960, p.16.

Hence, for the purpose of defining market conditions in this study, the Primary and Secondary Trends are jointly identified and the Minor Trends are considered as part of the Secondary Trend. This means that for a trend to be accepted, the length between the high and low points must last more than three weeks, or fifteen observations, i.e. a constraint in the form of $i \geq 15$ is imposed, based on the Dow Theory, to avoid considering minor trends. It should be emphasized that this definition of market trend aims at identifying the immediate outlook of the market but is not concerned with either the day-to-day fluctuations on the one hand or the trends over some years on the other hand.

$$HSI_i = a + bt_i$$

where HSI_i is the closing Hang Seng Index on i th day

t is the time unit of measure

a, b are coefficients.

The trend will be indicated by the sign of the β coefficient. A positive sign reveals an upward trend whereas a negative sign shows a downward trend. A new trend is indicated when the sign of β changes.

Using this approach, a total of 22 trends are identified from the Hang Seng Index movements during the period.

(ii) The volatility variable is determined by relative ranking of the trends between 1970 and 1973, each of varying size, based on the daily values of the Hang Seng Index.

$$T_i = HSI_i - HSI_{i-1}$$

where T_i is the difference of the Hang Seng Index from the previous day,

HSI_i , the closing Hang Seng Index for i th day.

i a date on a specific trend ends,

and $i = 1, 2, 3, \ldots\ldots n$

$n \geq 15$ days

The standard deviation of the changes of Index for the j th trend is

$$S.D._j = \text{S.D. of } T = \sqrt{\frac{\sum_{i=1}^{n} (T_i - \bar{T}_i)^2}{n-1}}$$

For the 22 trends in 1970 - 1973, 22 value of $S.D._j$ are available:-

$S.D._1$, $S.D._2$, ... $S.D._{22}$

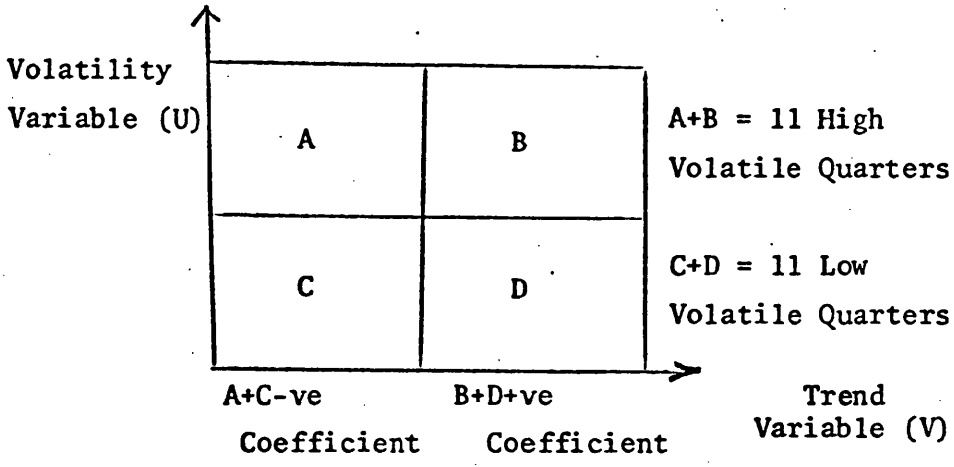
These values are then ranked according to magnitude and the 11 lower rankings are taken as reflecting the low volatile state and 11 higher rankings the high volatile state. Hypothetically, the ranking takes some form such as:-

S.D.(1) , S.D.(3) , S.D.(4) ....., 11 low volatile states

S.D.(2) , S.D.(10) , S.D.(22) ....., 11 high volatile states.

(iii) The two variables of trend and volatility will assume the relationship shown in Fig.4.2 and will be incorporated into the pricing model as dummy variables.

Figure 4.2 Relationship between Trend and Volatility



(iv) The results of market definition in time serial form are shown in Table 4.6. The market definition when transformed into dummy variables are shown in Table 4.7.

HANG SENG INDEX

HANG SENG INDEX 1970-1973

(APRIL 1, 1964 = 100)

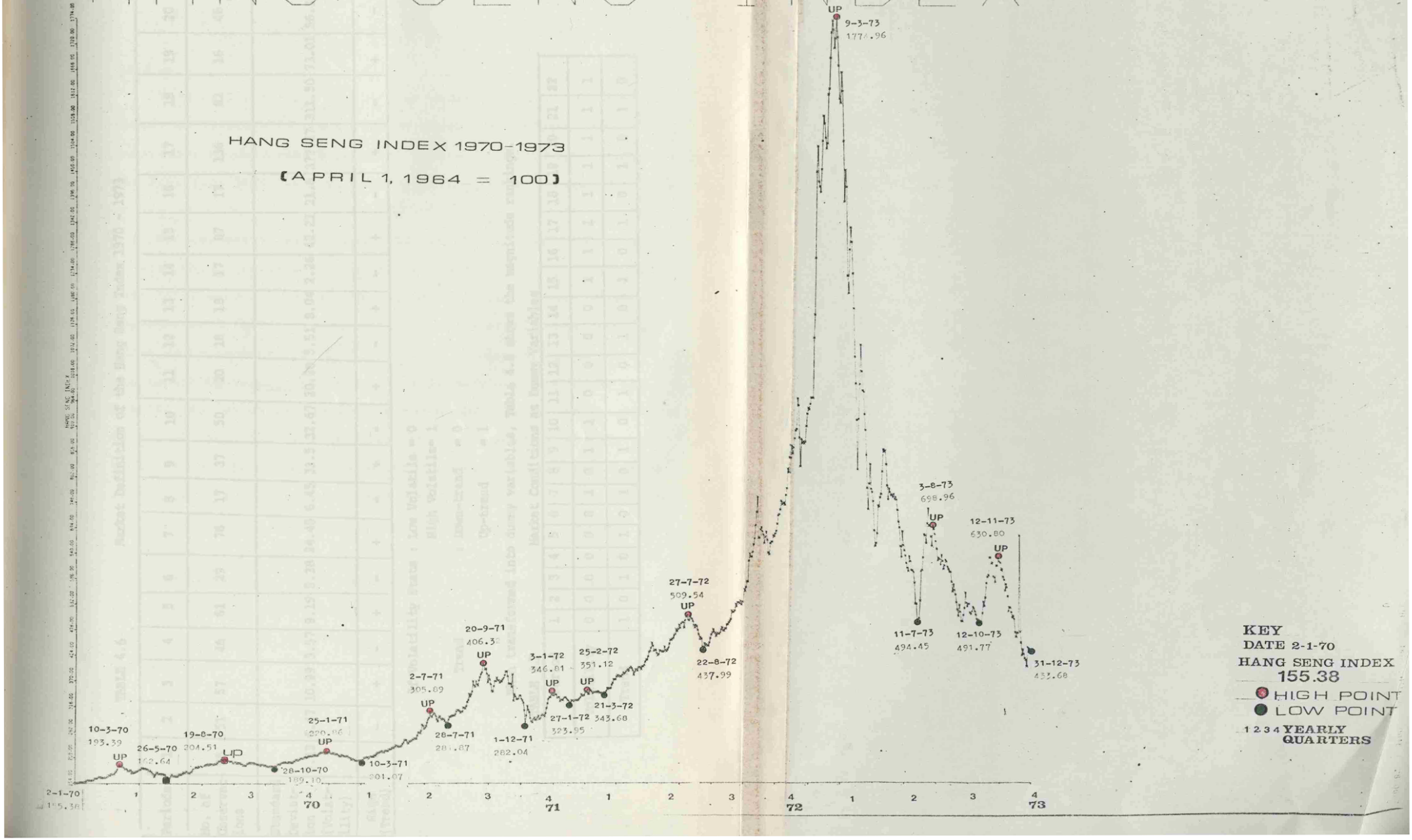


TABLE 4.6 Market Definition of the Hang Seng Index 1970 - 1973

Periods	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
No. of Observations	46	51	57	46	61	29	76	17	37	50	20	18	18	17	87	17	136	82	16	46	21	33
Standard Deviation (Volatility)	9.12	6.47	10.99	3.57	9.19	5.38	24.45	6.45	33.5	32.67	20.28	5.51	8.04	2.26	42.21	21.6	372.37	311.50	73.01	56.36	50.47	73.15
Sign (Trend)	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-

If Volatility State : Low Volatile = 0
High Volatile= 1

Trend : Down-trend = 0
Up-trend = 1

When transformed into dummy variables, Table 4.8 shows the magnitude rankings.

TABLE 4.7 Market Conditions as Dummy Variables

Period	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Volatility	0	0	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1
Trend	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0

CHAPTER V

DECISION MODELS : MAJOR ISSUING HOUSES

Wardley

Wardley Limited was the largest underwriter both in value and number of listings in the period of study. As Wardley is a subsidiary of Hong Kong & Shanghai Bank and handled new issues for the Bank from 1972 onwards, samples of the two are combined.

Wardley participated in a total of 68 listings. Of which, 24 were wholly underwritten by Wardley and 44 jointly-underwritten with other merchant banks. The 68 underwriting participations represented 30.91% of the market by numbers of listings, with a total value amounting to $1,233,138,233, representing 33.64% of the market by value. Wardley's average participation value was $18,134,385, which was much above the market average of $10,565,254. Of the 68 companies, 4 were investment companies which either provided no price-earnings forecast or even when provided were not meaningful, so they were excluded from this study. One other was a utility company, and since it was the only utility company floated in the period, it was excluded for model construction but examined separately. Also excluded was Hang Seng Bank because of the lack of sufficient testing data. This means that 62 samples are used in the study. An industrial breakdown is shown in Table 5.1.

TABLE 5.1 Industrial Classifications of Wardley Issues

Land	23	37%
Textile	12	19%
Commercial	11	18%
Hotel	5	8%
Shipping & Dock	8	13%
Financial	3	5%
	62	100%

The 62 listings are divided into 43 and 19 companies. Forty three are used for constructing the pricing model and 19 are used for testing the model, and each group is divided by industry as nearly as possible as the 62 listings in Table 5.2.

TABLE 5.2 Grouping of Date for Wardley Model Construction and Testing

	Weights(%)	Date for Model Construction	Hold-out Data for Model Testing
Land	37%	16	7
Textile	19%	8	4
Commercial	18%	8	3
Hotel	8%	3	2
Shipping & Dock	13%	6	2
Financial	5%	2	1
	100%	43	19

Yearly listings by industrial groups were shown in Table 5.3.

TABLE 5.3 Yearly Issues of Wardley by Industries

	1970	1971	1972	1973	Total
Land	5	0	13	5	23
Textile	6	2	4	0	12
Commercial	3	4	2	2	11
Hotel	2	1	1	1	5
Shipping & Dock	0	1	3	4	8
Financial	0	0	2	1	3
	16	8	25	13	62

The selection of the 43 samples for model construction is based on the data prospectus from 1970 - 1973, with the subsequent 19 samples for testing. As a result, the following samples from different industries are used in the model construction:-

Land	16 samples prior to November, 1972.
Textile	8 samples prior to January, 1972.
Commercial	8 samples prior to September, 1972
Hotel	3 samples prior to January, 1972.
Shipping & Docks	6 samples prior to April, 1973.
Financial	2 samples prior to January, 1973.

From Table 5.4 the pricing model based on the selected 43 samples using the least square analysis takes the form of :-

$$\log P/E_i = 0.79253 - 0.05197 \log \text{ASMIX} + 0.07420 \log \text{TASS} - 0.50739 \log \text{DCOV} - 0.46478 \log \text{INT}$$

where ASMIX, or Asset Mix, is the ratio of current assets to net tangible assets of the new listings,

TASS is the size of the company given by the total assets of the firm,

DCOV is the forecasted dividend cover multiple,

and INT is the one year bank fixed deposit rate at the time of issue.

The model constructed with the 4 variables, achieves a correlation coefficient of 0.742 or a R^2 of 0.55056. No multi-collinearity appears through the stepwise regression.

TABLE 5.4 Pricing Model for Wardley Ltd.

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.05197	3.22	0.005
Total Assets (log)	0.07420	2.50	0.02
Dividend Cover (log)	-0.50739	2.17	0.05
Market Interest Rate (log)	-0.46478	2.22	0.05

Residual Error	0.06430
Multiple Correlation (R)	0.742
R^2	0.55056
Intercept Term (α)	0.79253
Degrees of Freedom	38
Critical Value of T-Statistic at 30 d.f. with 0.05 level of significance	2.042
F-Statistic with 4 $d.f._1$ and 38 $d.f._2$	11.6616
Critical value of F-Statistic at 4 $d.f._1$ and 30 $d.f._2$ with 0.05 level of significance	2.6896

Variables not in the Regression Set	T-Statistic
Net Asset per Share (log)	1.07
Volatility	0.18
Trend	0.52

The four variables in the model, although significant at the 0.05 level, differ individually in the degree of significance. The most significant one, asset mix, has a level better than 0.05 and has a negative relationship with respect to the price-earnings ratio. This means that Wardley pitched a lower price for companies with a heavier current asset content in their net tangible assets. This may perhaps be due to the lower earning power of current assets, particularly in real estate companies, which were frequent listings in the period. For companies with a lower current asset base, pricing tended to be higher.

The next significant variable of a level of better than 0.02, the size of the listed company indicated by the total assets of the firm, has a direct relationship with the price-earnings ratio. This confirms the general expectation that the size of the firm carries a direct relationship in pricing, i.e.the bigger the company the higher it is priced.

Market interest rate as the third significant variable of better than 0.05 level also assumes a direct but negative relationship in the price determination process. Although a fixed deposit with a bank represents a method of investment somewhat different from that of acquiring new issues by an investor, this rate of return is a determinant in the pricing process. Understandably, when investing in the new issues,

one has to consider the opportunity rate of return prevailing in the money market. The relationship established by the model indicates that as the fixed bank deposit interest rate moves up, the pricing of new issues will be adjusted downwards by Wardley to give a correspondingly higher rate of return to the investors.

The fourth explanatory variable, dividend cover, also better than 0.05 level assumes a direct but negative relationship with the price of a new issue. This means that Wardley tended to price companies with a more liberal dividend policy at a higher level and price companies with a lower dividend payout ratio at a relatively lower price-earnings ratio. It seems that a more conservative dividend policy or a higher reinvestment rate of profits would result in a lower pricing of the new issues.

There are three explanatory variables not significant within the 0.05 level for acceptance in the model construction. The net asset per share variable is the more significant of the three. However, the inclusion of this variable does not improve the explanatory power of the model significantly as R^2 only moves up from 0.551 to 0.564. It appears that Wardley does not give consideration to the realization value on a per share basis by the net asset per share variable when pricing a new issue.

The two other variables, market volatility and trend, were intended to relate pricing to the outlook of the market conditions in general and their insignificance seemed to indicate that Wardley did not give significant consideration to the immediate technical outlook of the market in its pricing process.

Applying the three tests to validate the model with the hold-out data the D-Statistic of the Kolmogorov - Smirnov Test reveals d_n of 0.63 which is less than the critical value of 0.895 at 5%. Hence, the residuals of the hold-out data assume a normal distribution.

Using the F-Test to test whether the error term from the validation is different from the prediction model, this is given by

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{19-1,\ 38}$$

where $(\sigma^2)^V$ is the variance of validation

$(\sigma^2)^R$, the variance of the prediction model,

and F , is the critical value with 18 and 38 degrees of freedom.

Therefore $\frac{0.00303265}{0.0041346443} = 0.73347 \approx F_{20,\ 40} = 1.8389$

The F-Statistic is less than the critical value of 1.8389 at 5% level with 20, 40 degrees of freedom. Hence, the error term of the validation is a constant of the error term of the prediction model.

Furthermore, when testing whether the error ϵ has a zero mean, we use

$$\frac{(\bar{\epsilon})^{V}}{\sqrt{\frac{(\sigma^2)^{V}}{n}}} \approx t_{n-1}$$

$$= \frac{0.01802238}{\frac{0.0550695}{\sqrt{19}}} \approx t_{18}$$

$$= 1.427 \approx t_{18} = 2.101$$

The T-Statistic is less than 2.101 the critical value of T-Statistic at 0.05 level of significance with 18 degrees of freedom.

On the basis of the above three test on subsequent samples, the prediction model of Wardley cannot be rejected.

Examining the residuals of the observed and the estimated price-earnings ratio in Table 5.5, five samples have relatively large residuals, namely Safety Godown, Shipping General, Hutchison-Boag, Li and Fung Limited and Wing On Life (Holdings) Limited. Safety Godown has a negative residual indicating a discount on the observed pricing. It is unique as the only "godown" share in the period in the shipping category so perhaps the market price was lower than the estimate because of the different nature of its

business. Both Shipping General and Hutchison-Boag have a positive residual. Shipping General had a large mix of international investments. Although in terms of earnings, Shipping General appeared low, yet when measured by the market value of assets, it was at a price discount. This high underlying value accounted for the seemingly high price of shares of this company. Hutchison-Boag was listed by introduction and distributed to the shareholders of Hutchison International Ltd. by placement for subscription. A possible explanation why the observed P/E is higher than that of the estimated P/E may be that the method of distribution was similar to a rights issue and called for capital subscription from investors already holding shares in an associate company; there was less need to pitch a lower price to attract new subscribers unfamiliar to the stock.

As Li and Fung Limited was the only Chinese trading company at that time, it had been priced with a premium. It is worth noting that the pricing of this company confirms neither to the Wardley model or the Schroders & Chartered model. The uniqueness of the pricing of this particular company is discussed more fully under the Schroders and Chartered modelling. The Wing On Life (Holdings) Company Limited also commanded a premium price. This insurance company had a good asset backing. So even though earnings are not high, the company was considered adequately priced in terms of its underlying asset value.

It is worth noting that when the pricing model is applied to the only utility company, Cross Harbour Tunnel Ltd., it does not result in a large residual. It can be assumed that the prediction model still applies when pricing a different industrial listing at a subsequent date of 5th July, 1974.

TABLE 5.5 Residual Analysis for Wardley

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Anderson Holdings	0.96379	0.97710	-0.01331
Asia Insurance	1.00000	0.97980	0.02020
Beauforte Holdings	1.06221	1.06606	-0.00386
Cedar Garment Factory	0.81889	0.82035	-0.00147
Cheung Chong Holdings	1.00346	1.01738	-0.01392
Chuangs Cutlery	0.90309	0.97815	-0.07506
Chuangs Dev.	1.00903	1.06006	-0.05103
Cosmopolitan Properties	1.04218	1.02313	0.01905
Crocodile Garment	0.91169	0.98483	-0.07314
Empress Hotel	0.88986	0.92777	-0.03791
Fibres & Fabrics	0.81823	0.87334	-0.05511
Grand Marine	1.11327	1.09705	0.01622
The Great Eagle	1.01326	1.03762	-0.02436

TABLE 5.5 Residual Analysis for Wardley (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Hang Lung Dev.	1.12646	1.11983	0.00662
Harbour Centre	1.06819	1.06821	-0.00002
Harriman Holdings	1.04805	0.98414	0.06391
H.K. Building Loan	1.06070	1.04173	0.01897
H.K. Development	0.94939	0.94883	0.00056
Hopewell Holdings	1.07555	1.05212	0.02343
Hsin Chong Holdings	1.08279	0.99088	0.09191
Hutchison Boag	1.04100	0.91399	0.12701*
Hutchison Fung	1.11394	1.06457	0.04937
Lap Heng	0.84448	0.89358	-0.04911
Metro Dodwell	0.96379	0.94885	0.01494
Miramar Hotel	1.10003	1.05288	0.04714
Murjani Holdings	0.87852	0.95920	-0.08067
Nan Fung Textiles	0.94300	0.99020	-0.04720
Ocean Land Dev.	1.06296	1.07915	-0.01619

TABLE 5.5 Residual Analysis for Wardley (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Paul Y Construction	1.04139	0.96571	0.07569
Property Enterprise	1.07918	1.04029	0.03889
Realty Development	1.08350	1.11398	0.03048
Safety Godown	0.84881	0.99326	-0.14446*
Shaw Brothers	1.01072	1.00845	0.00227
Shipping General	1.17782	0.98038	0.19745*
Shui Hing	0.92531	0.99600	-0.07069
Shun Tak Enterprise	0.94939	1.03782	-0.08843
Smart Shirt	0.88649	0.91302	-0.02653
South China Morning Post	0.96848	0.96110	0.00738
Sun Hung Kay Holdings	1.07041	1.02809	0.04231
Sutherland Estates	1.08350	1.06760	0.01590
Tajmahals	0.97312	0.89768	0.07545
Yangtzekiang Garment	0.90580	0.94666	-0.04086
Wah Kwong Shipping	1.08814	1.09901	-0.01087

TABLE 5.5 Residual Analysis for Wardley (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Continental M. Inv.	1.03941	1.01549	0.02392
H.K. Properties	0.90902	0.97915	-0.07013
Mohans Property Inv.	1.06558	1.00457	0.06101
New World Development	1.14051	1.12543	0.01508
Oxford Property Finance	0.97359	1.04854	-0.07495
Tai Cheung Property	1.04100	1.03094	0.01005
Tai Sang Land Dev.	1.03902	1.06902	-0.03000
Island Dyeing	0.97081	0.96579	0.00503
Unitex	0.94890	0.98121	-0.03231
Jan Sin Mee Garment	0.98900	0.97708	0.01192
Mei Fung Fibre	0.95424	0.91768	0.03656
H.K. Carpet Mfg.	0.97681	0.90113	0.07568
Li and Fung	1.12057	1.01296	0.10762*
H.K. Optical	1.03743	0.97890	0.05852

TABLE 5.5 Residual Analysis for Wardley (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Ruby Holdings	1.04532	1.03202	0.01330
Park Hotel	1.07664	1.08408	-0.00744
Orient Overseas Containers	1.07918	1.09632	-0.01714
Mutual Maritime	1.07298	1.06138	0.01160
Wing On Life Holdings	1.16435	1.02028	0.14408*
Cross Harbour Tunner	1.09061	1.01557	0.07505

Jardine Fleming

The pricing model for the second largest merchant bank, Jardine Fleming, includes issues underwritten by Jardine Matheson in 1970. Jardine Fleming is a joint venture between Jardine Matheson, the largest trading company in Hong Kong, and Robert Fleming, a London merchant banker. Since 1970, Jardine Matheson has become inactive in underwriting while Jardine Fleming has become increasingly active. As with Wardley sample selection for the model construction, it was based on different industrial classifications listed over the period 1970-1973.

Jardine Matheson and Jardine Fleming together underwrote 31 companies, which was 14.09% of the market by number of listings. All 31 companies are jointly underwritten with other merchant banks. The total dollar value was $418,704,250 which represented 11.42% of the total market. Jardine had an average of $10,565,254. Of the 31 companies, two were investment companies which were samples excluded from this study. The industrial classifications of the 29 issues are shown in Table 5.6.

TABLE 5.6 Industrial Classifications of Jardine Fleming Issues

Land	11	38%
Textile	6	21%
Commercial	5	17%
Hotel	2	7%
Shipping & Dock	4	13%
Financial	1	4%
	29	100%

The new listings were divided into two groups of 23 and 6 companies, accordingly for the model construction and for testing the model and each group was subdivided according to the weighting of an industrial classification as shown in Table 5.7.

TABLE 5.7 Grouping of Data for Jardine Fleming Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-out Data for Model Testing
Land	38%	10	1
Textile	21%	5	1
Commercial	17%	4	1
Hotel	7%	1	1
Shipping & Dock	13%	3	1
Financial	4%	0	1
	100%	23	6

Yearly listings by industrial groups were shown in Table 5.8.

TABLE 5.8 Yearly Issues of Jardine Fleming by Industries

	1970	1971	1972	1973	Total
Land	3	0	6	2	11
Textile	3	2	1	0	6
Commercial	3	2	0	0	5
Hotel	1	1	0	0	2
Shipping & Dock	0	0	1	3	4
Financial	0	0	0	1	1
	10	5	8	6	29

The 23 samples used for constructing the model were chosen with the following cut-off dates leaving 6 samples with later dates for testing:-

Land	10 samples prior to 29th January, 1973
Textile	5 samples prior to 4th December, 1972
Commercial	4 samples prior to 21st November, 1971
Hotel	1 sample prior to 1st February, 1971
Shipping & Dock	3 samples prior to 13th August, 1973

By linear regression analysis, the pricing model as shown Table 5.9 takes the form of:-

$$\log P/E_i = -0.22024 - 0.08206 \log ASMIX + 0.14992 \log TASS$$

where ASMIX is the ratio of current asset to net tangible asset of the new listings,

TASS , the size of the company given by the total asset of the firm.

TABLE 5.9 Pricing Model for Jardine Fleming

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.08206	2.59	0.02
Total Assets (log)	0.14992	5.15	0.001

Residual Error	0.05837
Multiple Correlation (R)	0.862
R^2	0.7430
Intercept Term (α)	-0.22024
Degrees of Freedom	20
Critical Value of T-Statistic with 20 d.f. at 0.05 level of significance	2.086
F-Statistic with 2 d.f.$_1$ and 20 d.f.$_2$	29.0241
Critical value of F-Statistic with 2 d.f.$_1$ and 20 d.f.$_2$ at 0.05 level of significance	4.3513

Variables not in the Regression Set	T-Statistic
Net Asset Per Share (log)	0.73
Dividend Cover (log)	1.63
Market Interest Rate (log)	0.76
Volatility	0.71
Trend	1.11

At 20 degrees of freedom, the critical value of T-Statistic is 2.086 at 0.05 level of significance as shown in Table 5.9. The model, constructed with the two variables, achieves a correlation coefficient of 0.86, or in explanatory power, R^2, 0.7430. Through the step-wise regression analysis, no multi-collinearity exists in the data.

It appears that Jardine Fleming places significant emphasis on the size of the company with a T-Statistic of a level of significance better than 0.001 level of significance. It also bears a direct relationship with the price-earnings ratio of the new listings, which means that the larger the firm, the higher it is priced. This confirms the general expectation that the size of the firm has a direct bearing on pricing.

Also significant is the variable of asset mix which assumes a significance level of better than 0.02. The negative relationship of this variable with respect to the price-earnings ratio means that companies with a heavier current asset content are priced lower. Similar to pricings by Wardley, this may be affected by the high percentage of real estates companies listed in the period. Five explanatory variables are not significant within the 0.05 level in the model construction. Of the five variables, 2 variables, dividend cover and trend are significant at the 0.3 level of significance.

Since there are only six samples for testing the model, the Kolmogorov-Smirnov Test is less meaningful. The residuals of the hold-out data are assumed to have a normal distribution. Applying the F-Test to determine whether the error term from the hold-out data is different from that of the prediction model, the F-Statistic is given by,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} = \frac{0.004564}{(0.0583693)^2}$$

$$= 1.3396 \approx F_{5,\,20} = 2.7109$$

Hence, the F statistic is less than the critical value of 2.7109 at 5% significance level with 5 and 20 degrees of freedom. The error term from the hold-out data is not significantly different from that of the prediction model.

Testing whether the error has a zero mean, we use,

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} = \frac{-0.02362}{\sqrt{\frac{0.004564}{6}}}$$

$$= 0.8564 \approx t_5 = 2.5706$$

The T-statistic, 0.8564, is less than the critical value, 2.5706, at 0.05 level of significance with 5 degrees of freedom. On the basis of the above tests, the prediction model of Jardine cannot be rejected.

From Table 5.10, the residuals of the observed and the estimated price-earnings ratio reveal that only 2 samples have a relatively large residual i.e. Hsin Chong Ltd. and Wah Kwong Properties. Hsin Chong Holding is primarily a construction company, contracting for both government and private works. Although the company also has tangible asset as investments, it relies on its intangible earning power as a major source of income. It is the evaluation of this intangible earning power which may have caused a higher residual in pricing than estimated.

Another company with a large residual is Wah Kwong Properties which is priced at a discount from the model estimate. This under-pricing can be explained by the fact that Jardine had accepted the underwriting of this issue but did not play an active part in pricing the share.

Upon further discussions with officials of Jardine Fleming, it is felt that while the model may reflect the pricing done during the period 1970 - 1973, more considerations would be given to the market conditions in the future. This means that the model can be adjusted to take the form of:-

$$\log P/E_i = -0.22024 - 0.08206 \log ASMIX + 0.14992 \log TASS + MKFT$$

where MKFT is the market factor.

Unfortunately, because of the lack of subsequent equity issues by Jardine, this model cannot be validated yet.

TABLE 5.10 Residual Analysis for Jardine Fleming

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
China Engineer	0.98318	0.94787	0.03531
Cosmopolitan Property	1.04218	1.00661	0.03558
Fibres & Fabrics	0.81823	0.87485	-0.05663
Gammon	1.00000	0.92296	0.07705
Grand Marine	1.11327	1.11097	0.00230
Hang Lung Dev.	1.12646	1.15695	-0.03050
Hopewell Holdings	1.07555	1.05490	0.02064
Hong Kong Worsted Mills	0.77815	0.85318	-0.07503
Hsin Chong Holdings	1.08279	0.96903	0.11375*
Lap Heng	0.84448	0.89430	-0.04983
Miramar Hotel	1.10003	1.07353	0.02649
Murjani Holdings	0.87852	0.94544	-0.06692
New World Dev.	1.14051	1.17565	-0.03515
Pioneer Ind. Holdings	0.82347	0.87460	-0.05113

TABLE 5.10 Residual Analysis for Jardine Fleming (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Shaw Brothers	1.01072	0.97749	0.03323
Shun Tak Ent.	0.94939	1.03401	-0.08462
Smart Shirts	0.88649	0.91989	-0.03340
Sun Hung Kai Holdings	1.07041	1.01926	0.05115
Wah Kwong Shipping	1.08814	1.12119	-0.03306
Zung Fu	0.93450	0.84090	0.09360
Crocodile Garment	0.91169	0.92755	-0.01586
Tai Cheung Property	1.04100	1.01553	0.02547
Tai Sang Land Development	1.03902	1.08569	-0.04667
Continental M. Investment	1.03941	1.07613	-0.03672
Wah Kwong Property	1.00000	1.10647	-0.10647*
Unitex	0.94890	0.95353	-0.00463
South China Morning Post	0.96848	0.87388	0.09460
Harbour Centre	1.06819	1.12968	-0.06149
Wing On Life (Holdings)	1.16435	1.19136	-0.02701

Schroders & Chartered

Since Schroders & Chartered is an associate company of Chartered Bank, pricing observations of Chartered Bank are included in constructing the model for Schroders & Chartered in 1970 - 1973. Again sample selections are based on industrial classifications by weighting and samples selected for testing will be based on subsequent time sequence. During the period of study, Schroders underwrote 22 companies representing 10% by number of listings, with a total value of $271,363,625, being 7.4% of the total value of the new issue market. Their average participation was $12,334,710, which was above the market average of $10,565,254 per participation. Schroders & Chartered underwrote 7 companies solely and sub-underwrote 15 companies jointly with other underwriters. The industrial breakdown of the issues are shown in Table 5.11.

TABLE 5.11 Industrial Classifications of Schroders & Chartered Issues

Land	7	31%
Textile	5	23%
Commercial	5	23%
Shipping	4	18%
Financial	1	5%
	22	100%

The 22 samples are divided into 2 groups of 16 samples for construction of the model and 6 samples for the testing of the model as shown in Table 5.2. Weightings based on industrial classification are used for selecting samples for the model constructed.

TABLE 5.12 Grouping of Data for Schroders & Chartered Model Construction and Testing

	Weights (%)	Data for Model Construction	Hold-out Data for Model Testing
Land	31%	5	2
Textile	23%	4	1
Commercial	23%	4	1
Shipping & Dock	18%	3	1
Financial	5%	0	1
	100%	16	6

During the period, distribution of listings based on industrial classifications are shown in Table 5.13.

TABLE 5.13 Yearly Issues of Schroders & Chartered by Industries

	1970	1971	1972	1973	Total
Land	1	0	2	4	7
Textile	1	0	3	1	5
Commercial	1	0	1	3	5
Shipping & Dock	0	1	1	2	4
Financial	0	0	1	0	1
	3	1	8	10	22

Samples for model construction were based on time sequence as follows:-

Land	5 samples prior to 27th March, 1973.
Textile	4 samples prior to 9th February, 1973.
Commercial	4 samples prior to 27th March, 1973.
Shipping & Dock	3 samples prior to 6th April, 1973.

By least square analysis, the regression model assumes the form of:-

$$\log P/E_i = -0.02047 + 0.17658 \log NASPS + 0.10796 \log TASS + 0.12884 VOLAT$$

where the NASPS is the net asset per share,

TASS , the size of the company given by the total asset of the firm,

and VOLAT, the volatility state of the market.

TABLE 5.14 Pricing Model for Schroders & Chartered

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Net Asset per Share (log)	0.17658	3.42	0.01
Total Assets (log)	0.10796	2.64	0.025
Market Volatility	0.12884	3.20	0.01

Residual Error 0.05206

Multiple Correlation (R) 0.888

R^2 ..... 0.7885

Intercept Term (α) .....-0.02047

Degrees of Freedom 12

Critical value of T-statistic with 12 d.f. at 0.05 level of significance 2.179

F-Statistic with 3 d.f.$_1$ and 12 d.f.$_2$ 14.8628

Critical value of F-Statistic with 3 d.f.$_1$ and 12 d.f.$_2$ at 0.05 level of significance.. 3.4903

Variables not in Regression Set	T-Statistic
Asset Mix (log)	0.64
Dividend Cover (log)	0.66
Market Interest Rate (log)	1.24
Market Trend	0.58

In the model as shown in Table 5.14, two out of the three significant variables are significant at the 0.01 level of significance. Schroders seems to have placed more emphasis on the net asset per share with a direct relationship to pricing, i.e. the higher the net asset value per share, the higher the price is fixed. Market volatility is the second important variable in the pricing decision. This factor indicates the extent to which uncertainty in the market is taken into account. It appears that a higher price is set when the market is more volatile presumably to permit protection against increased market uncertainty. The third significant variable in the model, with a significance level of 0.025, is the size of the firm with respect to total asset value of the net issues. Again, the direct relationship seems to indicate that larger firms are priced higher.

Although market volatility is considered a significant variable used in pricing, another market indicator, the market trend, is much less significant in the pricing-decision; and so are other variables not in the regression set, viz. asset mix, dividend cover and market interest rate.

As there are insufficiently large samples to apply the Kolmogorov-Smirnov Test of Normality, the residual error of the validation is assumed to have a normal distribution.

Applying the F-Test on the error term,

$$\frac{(\sigma^{2})_{V}}{(\sigma^{2})_{R}} \approx F_{6-1,\ 12}$$

$$= \frac{0.011140506}{0.002709} = 4.112 \approx F_{5,12} = 3.11$$

The result of the F-Test with 6 observations appears to reject the model so constructed. However, on examining the residuals of the sum of squares of $(\log P/E_i - \widehat{\log P/E_i})$, it appears that one company had an exceptionally large residual of 0.16668 constituting 49.6% of the residual sum of squares of 0.05602. This company is Li & Fung Ltd. which is unique as a real estates company with trading interests. The pricing at which this issue was priced was relatively high because firstly the company had an outstanding compound earnings growth record up to the time of the issue, including its forecast for the following year. Secondly, its trading interests also had a certain "sex-appeal" since there are very few trading companies in Hong Kong and all of those quoted up to that time were European managed companies; this was the first Chinese managed trading company to be quoted. Thirdly, the stock market at the time was very buoyant and was willing to accept a pricing which included a large goodwill element. Eliminating this sample, a F-Test will be given by:

$$\frac{(\sigma^{2})_{V}}{(\sigma^{2})_{R}} \approx F_{5-1,\ 12}$$

$$= \frac{0.0063043}{0.002709}$$

$$= 2.327 \approx F_{4,\ 12} = 3.26$$

The F-Statistic is less than the critical value of 3.26 ($F_{4,\ 12}$) with 0.05 level of significance.

Using the T-Test to test whether the error term $\bar{\epsilon}$ has a zero mean,

$$\frac{(\bar{\epsilon})^{v}}{\sqrt{\frac{(\sigma^{2})^{v}}{n}}} \approx t_{5-1}$$

$$= \frac{-0.00728958}{\sqrt{\frac{0.0111405}{5}}}$$

$$= -0.15443 \approx t_{4} = 2.776$$

This T-Statistic is less than the critical value of 2.776 with 4 degrees of freedom. Hence, the F-Test and T-Test show that the prediction model cannot be rejected with the elimination of the Li and Fung Limited sample.

Examining the residuals in Table 5.15, one other observation contains a large and positive residual, i.e. Shipping General. It is interesting to note that Shipping General is jointly underwritten by Wardley Ltd. and Schroders & Chartered. The differential of the observed and estimated P/E from the 2 regression models both indicated a positive and relatively large residual, this may indicate the observed price may be high among the pricing norms of the two underwriters. This residual can be accounted for by Shipping General having a mix of investments internationally together with shipping interest. The Company's investments are held in the form of an investment trust.

For this portion of its investments, earnings are derived from dividends paid by the companies which it has invested. Low pay-out ratios of international companies plus the payment of withholding tax in the countries of investment results in lower earnings in relation to its assets. In fact, a common phenomenon is that most international investment trusts have high P/E ratios. Yet, the shares of investment trusts always stand a discount to their underlying asset value. In pricing this issue despite the proportional high P/E ratio, the price was at a discount to the underlying asset value.

Another significant residual is given by City and Urban Properties with a negative residual. City and Urban would appear to have been underpriced because it was the first issue - other than Japanese depositary receipt issues - since April 1973.

The market had fallen consistently since that time and apart from being very nervous it was considered by most poeple to be non-receptive to a relatively large issue such as this one. The "quality" of profits was not considered to be high since they rose largely from property development rather than earnings from property holdings and investment holdings. Perhaps, most importantly, Schroders and Chartered together with the company directors felt that if the issue was to proceed it would have to be seen to be at least a limited susscess. For all these

reasons the pricing was on terms which in other circumstances would have appeared to be unduly generous, but which at the time, despite this generosity, only just succeeded in getting the issue reasonably subscribed.

It is worth noting that the only company in the Finance and Insurance group, Hong Kong Building Loan Agency does not appear to have a large residual. It can be assumed that it also obeys the pricing model.

TABLE 5.15 Residual Analysis for Schroders & Chartered

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Allied Food Industry	0.96520	1.01472	-0.04952
Cheung Kong Holdings	1.00346	1.02649	-0.02303
China Engineer	0.98318	0.93644	0.04674
Chow Sang Sang	0.97359	0.93471	0.03888
Hong Kong Worsted Mills	0.77815	0.81010	-0.03195
International Maritime	1.14239	1.08138	0.06101
Island Dyeing	0.97081	0.99050	-0.01969
Liu Chong Hing	1.07041	1.12879	-0.05838
Pioneer Ind. Holdings	0.82347	0.83827	-0.01479
Shipping General	1.17782	1.07666	0.10116*
Singtao Newspapers	1.04139	1.00748	0.03392
Unisouth	1.02735	1.10024	-0.07289
Wah Kwong Shipping	1.08814	1.08196	0.00618
Easey Garment	0.97864	0.98928	-0.01065
Siu On Realty	0.95085	0.94410	0.00675
Wah Kwong Property	1.00000	1.01372	-0.01373

TABLE 5.15 Residual Analysis for Schroders & Chartered (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
City Urban Property	1.02776	1.15143	-0.12367*
Far East Wool	0.90417	0.85210	0.05208
Hong Kong Carpet Mfg.	0.97681	1.01840	-0.04159
Orient Overseas	1.07918	1.08434	-0.00516
Li and Fung	1.12057	0.95390	0.16668*
H.K. Building Loan	1.06070	1.15277	-0.09207

Hang Seng Bank

Pricing observations for Hang Seng Finance Limited are grouped together with those for Hang Seng Bank during 1970-1973 in the construction of the pricing model. A total of 24 companies were handled by Hang Seng with a total underwriting value of $260,187,500 representing 7.10% of the total market share by value on 10.91% of the market in terms of number of listings. The average Hang Seng participation was $10,841,145 which was very near the average market participation of $10,565,254. The 24 issues handled include 8 sole underwritings and 16 sub-underwritings. An industrial breakdown of the new listings handled by Hang Seng is shown in Table 5.16.

TABLE 5.16 Industrial Classifications of Hang Seng

Land	12	50%
Textile	4	17%
Commercial	2	8%
Hotel	3	13%
Shipping and Dock	2	8%
Financial	1	4%
	24	100%

Selecting samples for the model construction is also based on the weights of individual industry and their prospectus date of issue as shown in Table 5.17.

TABLE 5.17 Grouping of Data for Hang Seng Model Construction and Testing

	Weights(%)	Data for Model Construction	Hand-Out Data for Model Testing
Land	50	8	4
Textile	17	3	1
Commercial	8	1	1
Hotel	13	2	1
Shipping and dock	8	1	1
Financial	4	0	1
	100%	15	9

The only financial company underwritten by Hang Seng in the period was the Hong Kong Building & Loan Agency Ltd. As this was the only company of its type listed in the period, it is used to test whether its pricing was based on the pricing model of other industries.

In 1970-1973, listings based on industrial classifications are shown in Table 5.18.

TABLE 5.18 Yearly Issues of Hang Seng by Industries

	1970	1971	1972	1973	Total
Land	0	0	8	4	12
Textile	0	2	2	0	4
Commercial	0	1	1	0	2
Hotel	1	0	1	1	3
Shipping & Dock	0	0	0	2	2
Financial	0	0	1	0	1
	1	3	13	7	24

Samples for the model construction was based on dates of listings as follows:-

Land	8 samples prior to 29th January, 1973
Textile	3 samples prior to 28th December, 1972
Commercial	1 sample prior to 25th August, 1972
Hotel	2 samples prior to 15th February,1973
Shipping & Dock	1 sample prior to 13th August, 1973

The pricing model estimated from the 15 samples takes the form of:-

$$\log P/E_i = 0.18312 - 0.08455 \log ASMIX + 0.09949 \log TASS$$

where ASMIX is given by the ratio of current asset to net tangible asset of the company.

and TASS, the size of the company given by the total assets of the firm.

From Table 5.19, the pricing model constructed indicates that total asset is significant at 0.005 level and asset mix is significant at the 0.02 level. Relatively speaking, Hang Seng seems to have used total asset as a more important variable in its price determination process. Hang Seng also gives considerations to the market trend which is significant at the 0.1 level while market interest rate is at the 0.2 level of significance. However, the significance of these two latter variables may not be conclusively significant because of the sample size.

TABLE 5.19 Pricing Model for Hang Seng Bank

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.08455	2.92	0.02
Total Asset (log)	0.09949	4.17	0.005

Residual Error 0.04606

Multiple Correlation (R) 0.831

R^2 ..... 0.6905

Intercept Term (α) 0.18312

Degree of Freedom 12

Critical Value of T-Statistic with 12 d.f. at

0.05 level of significance 2.179

F-Statistic with 2 $d.f._1$ and 12 $d.f._2$ 13.4372

Critical value of F-Statistic with 2 $d.f._1$ and

12 $d.f._2$ at 0.05 level of significance 3.8853

Variables not in Regression Set	T-Statistic
Net Asset per Share (log)	0.42
Dividend Cover (log)	0.78
Market Interest Rate (log)	1.81
Volatility	0.53
Trend	1.82

As there are inadequate samples for a meaningful test of normality by the Kolmogorov-Smirnov Test, the residual error from the validation is assumed to have a normal distribution.

Using the F-Test on the nine samples error term,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{9-1,\ 12}$$

$$= \frac{0.001409}{0.0021213}$$

$$= 0.6642 \approx F_{8,12} = 2.849$$

Thus, the F-Statistic is less than the critical value of 2.849 ($F_{8,\ 12}$).

Applying the T-Test to test whether the error term $\bar{\epsilon}$ has a zero mean,

$$= \frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} \approx t_{9-1}$$

$$= \frac{-0.0275196}{\sqrt{\frac{0.001409}{9}}}$$

$$= 2.20 \approx t_8 = 2.306$$

Thus, the T-Statistic is less than the critical value of 2.306 (t_8) at 0.05 level of significance.

Both the F-Test and the T-Test indicate that the prediction model as constructed cannot be rejected by the validation samples.

Only one observation reveals a large residual as shown in Table 5.20, that of Murjani Holdings. The negative sign of the residual between the observed price and the estimated price seems to indicate a slight discount. Murjani Holding is a trading company which has textile quotas. Valuation of quotas as assets is difficult because if trade restrictions are removed, the quotas become worthless. Since the complete removal of trade restrictions seems unlikely, the pricing of Murjani was lowered. As the only finance company, Hong Kong Building & Loan Agency Ltd., does not have a large residual either, and it appears that its pricing appears to be in line with the pricing of other industries. In this respect, it may be inferred that the nature of pricing of different industrial groups may be similar for Hang Seng.

TABLE 5.20 Residual Analysis for Hang Seng Bank

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Crocodile Garment	0.91169	0.95766	-0.04597
Hip Shing Hong	1.00518	1.03994	-0.03476
Kamcourt Development	0.97451	0.94094	0.03357
Lai Sun Garment	0.92273	0.95666	-0.03393
Lee Hing Development	1.03822	1.03975	-0.00153
Magnificant Estate	1.04493	1.02232	0.02261
Miramar Hotel	1.10003	1.05288	0.04714
Murjani Holdings	0.87852	0.95681	-0.07829
New World Development	1.14051	1.12576	-0.01475
Orient Overseas Containers	1.07918	1.13863	-0.05945
Ruby Holdings	1.04532	0.99727	0.04806
Shaw Brothers	1.01072	0.98123	0.02949
Sun Hung Kai Holdings	1.07041	1.00704	0.06336
Wah Cheong Dev.	0.93952	0.94611	-0.00659
Wayson Dev.	0.93952	0.93799	-0.00153

TABLE 5.20 Residual Analysis for Hang Seng Bank (Cont'd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Wah Kwong Property	1.00000	1.08911	-0.08911
Tai Sang Land Development	1.03902	1.07469	-0.03568
Kai Ming Investment	0.92993	0.98339	-0.05346
Shun Fook Enterprise	0.97772	1.00232	-0.02459
Unison Knitting	0.86332	0.92519	-0.06187
Anderson Holdings	0.96379	0.95517	0.00862
Park Hotel	1.07664	1.07746	-0.00082
Continental Marina Investment	1.03941	1.06188	-0.02246
Hong Kong Building Loan	1.06070	1.02899	0.03171

Summary of Findings

Results of the construction pricing models for major issuing houses are given in Table 5.21. These pricing models indicated the significant use of asset variables in pricing new issues. The size of the company variable, given by the total assets of the company was used by all four major issuing houses. For Jardine Fleming and Hang Seng Bank, this variable was the most significant variable, with significance levels of 0.001 and 0.005 respectively. For Wardley and Schroders & Chartered, this variable is second in significance, with respective levels of significance at 0.02 and 0.025.

Three out of the four issuing houses used asset mix as a valuation criterion. In particular, this variable was the most significant variable in the Wardley model, with a significance level of 0.005, while that in Jardine Fleming and Hang Seng Bank were 0.02. Other variables used by Wardley were dividend cover and market interest rate, both significant at 0.05. Schroders & Chartered had significant variables some what different from the other three underwriters. Besides the size of company, net asset per share and market volatility were also considered, both significant at 0.01.

From Table 5.21, it is interesting to observe the pattern of the coefficient of the variable used by these issuing houses. Understandably, the weighting of the individual variables used would be different because of different decision processes. Yet the signs of the coefficients revealed consistency when a

particular variable was used. This consistency of coefficient signs indicated a pattern of logical thinking common to all these major issuing houses.

The most frequently used variable, total assets, had a positive coefficient, indicating the direct relationship of the size of the company towards pricing of the issue. This coincided with the general expectation that larger companies would have a better record of growth and a broader capital base to enable the issue to be priced higher. The next frequently used variable, asset mix, showed a negative coefficient, signifying an inverse relationship, i.e. the higher current asset content, the lower the issue would be priced. This also conformed with the general expectation that since current assets were liquid, their earning power would be lowered compared with that of fixed assets.

Two other variables, dividend cover and market interest rate were also used by major underwriters. The negative coefficients of the two were also reasonable. With the dividend cover, it reflected that higher the issue could be priced. For the market interest rate, the higher it was the lower the issue could be priced in order to give prospective investors a higher return to investment. Schroders and Chartered used two variables different from the other three major issuing houses, i.e. net assets per share and market volatility, both with positive coefficients. This indicated that the higher the net asset content, or in a volatile market, a higher price would be pitched.

As revealed by the F-Statistics, the four pricing models met the required significance level of 0.05. In terms of the explanatory power (R^2), of the models, Schroders & Chartered attained a high level of explanatory power at 0.79 while Wardley had a relative low of 0.55.

When tested with the hold-out data, indications were that three out of the four models cannot be rejected. In particular, it should be noted that Wardley, with enough samples for the Kolmogorov-Smirnov Test of normality, met the 0.05 significance level for all the three tests on the hold-out data. Although there were not enough data for the normality test,both Jardine Fleming and Hang Seng Bank met the other two tests for the hold-out data. Schroders and Chartered model should be accepted after the elimination of one company, Li and Fung from the hold-out data. Since this company was unique as explained in the text, the model was not rejected. Thus, all the four models may be accepted.

TABLE 5.21 Summary of Major Issuing House Models

	α	log ASMIX		log NASPS		log TASS		log DCOV		log INT		VOLAT		F Stat.	R^2	Test of Normality	Test of Variance	Test for Zero Mean
		Coef.	S.L.	Coef	S.L.	Coef.	S.L.	Coef.	S.L.	Coef.	S.L.	Coef	S.L.					
Wardley	0.79	-0.05	0.005			0.07	0.02	-0.51	0.05	-0.46	0.05			A	0.55	A	A	A
Jardine	-0.25	-0.08	0.02			0.15	0.001							A	0.74	I	A	A
Schroders	-0.02			0.17	0.01	0.10	0.025					0.13	0.01	A	0.79	I	Q	Q
Hang Seng	0.18	-0.08	0.02			0.10	0.005							A	0.69	I	A	A

A Hypothesis accepted with a significance level of 0.05.

Q Hypothesis accepted with qualifications.

I Inadequate data for meaningful testing.

α Intercept Term.

Coef. Coefficient.

S.L. T-Statistic Significance level.

CHAPTER VI

DECISION MODELS : SMALLER ISSUING HOUSES

The total value of new issues handled by Oriental Financial Consultants Ltd. amount to $119,050,000, representing a market share of 3.25%, ranking fifth amongst underwriting. In terms of numbers of issues participated, the Company ranks third with 29 participations. This means an average participation value of $4,105,172 per underwriting by Oriental Financial. In contrast to the average market participation value of $10,565,254, Oriental Financial has handled mostly the smaller size underwriting. The 29 issues consist of 21 sole underwriting and 8 sub-underwritings.

Of the 29 companies, 4 are investment companies which are excluded from the study. Two commercial companies, Computer Data and Hong Kong Antenna, plus Richfield International, a land development company, are excluded from the study because of insufficient data provision.

The industrial classifications of these 22 companies are shown in Table 6.1.

TABLE 6.1 Industrial Classifications of Oriental Financial Consultants Issues

Land	16	68%
Textile	2	9%
Commercial	4	23%
	22	100%

For the purpose of the model construction, 18 issues are chosen on a time sequence basis to construct the prediction model and 4 for the hold-out data. This is distributed as shown in Table 6.2.

TABLE 6.2 Grouping of Data for Oriental Financial Consultants Model Construction and Testing

	Data for Model Construction	Hold-out Data for Model Testing
Land	14	2
Textile	1	1
Commercial	3	1
	18	4

The selection is again chosen by the dates of listings with the distributions from 1970 - 1973 as shown in Table 6.3.

TABLE 6.3 Yearly Issues of Oriental Financial Consultants by Industries

	1970	1971	1972	1973	Total
Land	0	0	2	14	16
Textile	0	0	1	1	2
Commercial	0	0	0	4	4
	0	0	3	19	22

For the model construction, the following dates are used for the different industrial classifications:-

Land	14 samples prior to 28th February, 1973
Textile	1 sample prior to 24th Januray, 1973
Commercial	3 samples prior to 28th Feburary, 1973

The pricing model thus constructed as shown in Table 6.4 takes a form of: $\log P/E_i = 0.30029 + 0.12381 \log TASS - 1.32825 \log DCOV$

where TASS is the size of the company given by the total asset of the firm,

and DCOV, the forecasted dividend cover multiple.

At 15 degrees of freedom, the critical value of T-Statistic is 2.131 at 0.05 level of significance as shown in Table 6.4. The regression model achieves a multiple correlation of 0.901 or a R^2 of 0.8118. The most significant variable is dividend cover, with a significance level of better than 0.001, while the next significant variable is the size of the company with better than 0.05 significance. All issues are made when market conditions are volatile and on the up-trend, and when the market interest rate is at 4.875% per annum.

TABLE 6.4 Pricing Model for Oriental Financial Consultants

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Total Assets (log)	0.12381	2.18	0.05
Dividend Cover (log)	-1.32825	7.66	0.001

Residual Error	0.05952
Multiple Correlation (R)	0.901
R^2	0.8118
Intercept Term (α)	0.30029
Degrees of Freedom	15
Critical Value at T-Statistic with 15 d.f. at 0.05 level of significance	2.131
F-Statistic with 2 $d.f._1$ and 15 $d.f._2$	32.4343
Critical value of F-Statistic with 2 $d.f._1$ and 15 $d.f._2$ at 0.05 level of significance	3.6823

Variable not in Regression Set	T-Statistic
Net Asset per Share (log)	0.06

As the 4 observations in the hold-out data is not meaningful for the Kolmogorov-Smirnov Test, the residuals are assumed to have a normal distribution. Applying the F-test to determine whether the error term from the hold-out data is different from that of the prediction model, the F statistic is given by,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} = \frac{0.00238}{0.003542}$$

$$= 0.6727 \approx F_{3,15} = 3.2874$$

Thus, the F-Statistic is less than the critical value of 3.2874 at 5% significance level with 3 and 15 degrees of freedom. The test proves that the error-term from the hold-out data is not significantly different from that of the prediction model.

To test whether the error has a zero mean, we use,

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} = \frac{0.057285}{0.02439}$$

$$= 2.3485 \approx t_3 = 3.1825$$

The T-Statistic, 2.3485, is less than the critical value of 3.1825, at 0.05 level of significance with 3 degrees of freedom. On the basis of the above tests, the prediction model of Oriental Financial Consultants cannot be rejected.

Examining the residuals from Table 6.5 reveals that two companies assume large residuals, i.e. New Era Land Securities Ltd. and Alexander Knitting. No explanation can be accounted for the positive residual between the observed and the estimated price of New Era Land Securities Ltd., a land investment company.

Alexander Knitting revealed a significant negative residual, indicating under-pricing of the share according to the model. This can also be attributed to the instability of the textile industry because of often uncertain international trade conditions.

TABLE 6.5 Residual Analysis for Oriental Financial Consultants

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Apollo Tours	1.02119	1.09625	-0.07506
Chesterfield Mfg.	0.84634	0.89062	-0.04428
Dart Dev.	1.12385	1.07447	0.04938
E Tung	1.13033	1.14472	-0.01438
Essential Enterprise	0.83251	0.89257	-0.06006
Fraternal Dev.	0.90146	0.89708	0.00438
Hon Kwok Land Dev.	1.07918	1.07766	0.00152
International Industries	1.14922	1.17688	-0.02766
Lucky Man Enterprise	1.14613	1.14056	0.00557
Rose Knitting	0.93298	0.95819	-0.02520
Siu King Cheung	1.07918	1.05020	0.02898
Union Globe Dev.	0.99123	1.01120	-0.01997
Wai Yick Inv.	1.12937	1.16531	-0.03594

TABLE 6.5 Residual Analysis for Oriental Financial Consultants (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Winland Inv.	1.05729	1.12272	-0.06543
Yuen Sang Hardware	0.81090	0.78434	0.02656
New Era Land Securities	1.13033	0.98587	0.14446 *
Gold Union	1.27646	1.17985	0.09661
Yu Hing Holding	1.09167	1.08115	0.01052
Southeast Asia	1.13988	1.21888	-0.07900
Sun On Estate	1.11628	1.16971	-0.05343
Alexander Knitter	0.92064	1.02602	-0.10537*
Whitman Ent.	1.07188	1.06322	0.00866

Union Bank

Union Bank underwrote 17 companies which is 7.73% of the market in numbers of listings. It amounted to a total value of $88,874,000. i.e. 2.42% of the market share in dollar value. Hence, the average participation value of Union Bank is $5,227,882, which is low compared with the market average of $10,565,254 per participation. The 17 issues handled include 11 solely underwritten issues and 6 sub-underwritings.

The industrial classification of the new issues underwritten by Union Bank is as shown in Table 6.6.

TABLE 6.6 Industrial Classifications of Union Bank Issues

Land	14	82%
Commercial	1	6%
Hotel	1	6%
Shipping & Dock	1	6%
	17	100%

Since Union Bank has only underwritten one issue each in the Commercial, Hotel and Shipping categories, these three samples are used to test the model in its application to other industries. Primarily, the model will be constructed based on 11 samples of land, construction companies for the model construction and 3 samples of land, construction companies for testing the model as shown in Table 6.7. As the model is mainly constructed with land, construction observations, it is expected that the model will be more appropriate for pricing land companies.

TABLE 6.7 Grouping of Data for Union Bank Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-Out Data for Model Testing
Land	82%	11	3
Commercial	6%	0	1
Hotel	6%	0	1
Shipping & Dock	6%	0	1
	100%	11	6

During the period of study, the distribution of listings based on industrial classifications are shown in Table 6.8.

TABLE 6.8 Yearly Issues of Union Bank by Industries

	1970	1971	1972	1973	Total
Land	0	1	5	8	14
Commercial	0	0	0	1	1
Hotel	0	0	0	1	1
Shipping & Dock	0	0	1	0	1
	0	1	6	10	17

The 11 land samples for the model construction are listed before 27th February 1973. It is worth noting that all the issues are made in a volatile market and when the prevailing interest rate is 4.875% per annum. Only one issue was made in a down-trend out of the 17. Thus, the interest, volatility and trend variables are eliminated from the model construction.

By multiple regression analysis, the linear model takes the form of:- $\log P/E_i = 1.09218 - 1.04449 \log DCOV$

where. DCOV is the dividend payout ratio as determined by management.

TABLE 6.9 Pricing Model for Union Bank

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover(log)	-1.04449	12.00	0.001

Residual Error	0.01331
Multiple Correlation (R)	0.970
R^2	0.9409
Intercept Term (α)	1.09218
Degrees of Freedom	9
Critical value of T-Statistic with 9 d.f. at 0.05 level of significance	2.762
F-Statistic with 1 $d.f._1$ and 9 $d.f._2$	143.9663
Critical value of F-Statistic with 1 $d.f._1$ and 9 $d.f._2$ at 0.05 level of significance	5.1174

Variables not in Regression Set	T-Statistic
Net asset per Share (log)	0.22
Total Assets (log)	1.92

From the model shown in Table 6.9, only the dividend cover is a significant variable with a significance level of better than 0.001. The negative relationship between dividend cover and the price-earnings multiple indicates that Union Bank tends to price companies with a lower dividend payout ratio correspondingly lower. This may be accounted for by the possible expectations on investment returns to the investors. Reversly, Union Bank seems to fix a higher price for companies with a higher dividend payout ratio.

As there are insufficent samples for a meaningful test of normality, the residual error from the validation is assumed to have a normal distribution.

Using the F-Test on the variance of the six validation samples,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{6-1,\ 9}$$

$$= \frac{0.0013368}{0.00017727} = 7.54 \approx F_{5,\ 9} = 3.4817$$

This F-Statistic is greater than the critical value of 3.4817 ($F_{5,\ 9}$).

However, the result must be interpreted in the light of different industries consisting in the samples. Of the 6 observations drawn for testing the model, one is a commercial company, the other two being each a hotel and a shipping company. This indicates that the model when constructed by land company does not apply in pricing these three different industrial companies.

Apply the F-Test on the variance of the 3 validation samples,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{3-1,\ 9}$$

$$= \frac{0.0009743}{0.00017727} = 5.496 \approx F_{2,\ 9} = 4.2565$$

This F-Statistic prescribed level of 0.05 significance. Of the three samples, one company, Marvellous Investment Limited, has a relatively large residual as shown in Table 6.10. Although no reason can be accounted for to explain the difference of pricing this particular share, elimination of this sample will mean a F-Test of:

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{2-1,\ 9}$$

$$= \frac{0.00000112}{0.00017727} = 0.006318 \approx F_{1,\ 9} = 5.1174.$$

This F-Statistic is less than the critical value of 5.1174. Hence, the reject of the model may not be necessary.

Applying the T-Test to test the residual mean,

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} \approx t_{2-1}$$

$$= \frac{0.122695}{\sqrt{\frac{0.00017727}{2}}} \approx t_1 = 12.706$$

Thus, the T-Statistic is less than the critical value of 12.706. Therefore, if tested on two samples, the model may not be rejceted. The Union Bank model applies only to land companies and not to other industries. With the exception of one sample, land companies underwritten by Union Bank obey the pricing model so constructed.

TABLE 6.10

Residual Analysis for Union Bank

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Fu Chip Inv.	0.97772	0.99460	-0.01688
King Fung Dev.	1.05500	1.04894	0.00605
Luen Hing Shing	1.03342	1.02485	0.00857
Kien Shing Dev.	0.99520	0.98734	0.00785
Golden Hill	0.94939	0.93955	0.00984
Keng Fong Sin Kee	0.96848	0.98376	-0.01527
Luen On Inv.	1.03743	1.02878	0.00865
Union Globe Dev.	0.99123	0.98020	0.01103
King Fung Dev.	0.89265	0.90524	-0.01259
Fraternal Dev.	0.90146	0.89046	0.01000
Freedom Dev.	0.99123	1.00947	-0.01825
Y Lee Enterprises	0.96754	0.95605	0.01150
Marvellous Inv.	0.94201	0.98376	-0.04175
Winfair Inv.	0.88081	0.86778	0.01304
Highfield Sealand	0.78247	0.86502	-0.08255
Asia Stone	0.90526	0.94608	-0.04082
Pearl Island Inv.	0.91645	0.95605	-0.03959

Hang Lung Bank

In the period 1970-1973, a total of 16 companies are underwritten by Hang Lung representing 7.27% of the market in numbers of listings. Amounted to $93,459,000, being 2.55% market share in value. This means an average participation value of $5,841,187 per underwriting. Hang Lung seems to handle the smaller sizes of underwriting, when compared with the average market participation value of $1,000,565,254. The 16 issues underwritten include 14 sole underwritings and 2 sub-underwritings. Out of the 16 underwritings, 5 are investment companies which are excluded from this study. An industrial breakdown of the 11 new listings is shown at Table 6.11.

TABLE 6.11 Industrial Classifications of Hang Lung Bank Issues

Land	5	46%
Commercial	1	9%
Hotel	2	18%
Shipping & Dock	3	27%
	11	100%

Based on weightings of industrial classifications and their dates of issue, samples are selected for model construction and for model testing as in Table 6.12.

TABLE 6.12 Grouping of Data for Hang Lung Bank Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-Out Data for Model Testing
Land	46%	3	2
Commercial	9%	0	1
Hotel	18%	1	1
Shipping & Dock	27%	2	1
	100%	6	5

In 1970-1973, the listings are distributed as shown in Tabel 6.13.

TABLE 6.13 Yearly Issue of Hang Lung Bank by Industries

	1970	1971	1972	1973	Total
Land	0	0	1	4	5
Commercial	0	0	0	1	1
Hotel	0	0	2	0	2
Shipping & Dock	0	0	0	3	3
	0	0	3	8	11

For the model construction, the following dates are used for the different industrial classifications:-

Land 3 samples prior to 19th April, 1973.

Hotel 1 sample prior to 14th November, 1972.

Shipping & Dock 2 samples prior to 24th February, 1973

The pricing model estimated by linear regression of six observations assumes the linear form of:-

$$\log P/E_i = 1.18772 - 1.71283 \log DCOV$$

where DCOV is the forecasted dividend cover multiple.

As shown in Table 6.14, the model, with dividend cover as the significant variable at the 0.005 level of significance, attains a multiple correlation of 0.961 or a R^2 of 0.9235. This indicates that Hang Lung Bank puts a significant emphasis on the dividend policy of the company when pricing a new issue. The model reveals a direct relationship between the dividend payout and the P/E ratio.

It is worth noting that all issues, except one, are made when the market condition is volatile and on the up-trend. Similarly, all issues, except one, are made when interest rate is at 4.875% per annum. Thus, the interest, volatility and trend variables are eliminated in the model.

TABLE 6.14 Pricing Model for Hang Lung Bank

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover (log)	-1.71283	6.98	0.005

Residual Error	0.03082
Multiple Correlation (R)	0.961
R^2	0.9235
Intercept Term (α)	1.18772
Degrees of Freedom	4
Critical value of T-Statistic with 4 d.f. at 0.05 level of significance	2.776
F-Statistic with 1 $d.f._1$ and 4 $d.f._2$	48.6851
Critical value of F-Statistic with 1 $d.f._1$ and 4 $d.f._2$ at 0.05 level of significance	7.7086

Variable not in Regression Set	T-Statistic
Trend	2.14

As there are inadequate samples for the Kolmogorov-Smirnov Test of Normality, the residuals of the validation samples are assumed to have a normal distribution.

Using the F-Test on the variance of the 5 validation samples,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{5-1,\ 4}$$

$$= \frac{0.008255}{0.0009498} \approx F_{4,4} = 6.3883$$

Thus, the F-Statistic is greater than the critical value of 6.3883 ($F_{4,4}$).

Although the model may be rejected on the basis of this test, yet the five samples test includes a sample, Ming Ren Investment Enterprise, a shipping company which has a large residual of -0.20916 as shown in Table 6.15. While no reason can be attributed to the observed low pricing of this share, it may be desirable to exclude this sample from the validation.

Applying the F-Test on the variance of the 4 samples of validation,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{4-1,\ 4}$$

$$= \frac{0.00254111}{0.0009498} = 2.68 \approx F_{3,4} = 6.5914$$

Thus, the F-Statistic is less than the critical value of 6.5914 ($F_{3,4}$)

In order to test whether the sample mean is zero, the T-Test is used.

$$\frac{(\bar{\epsilon})^{\vee}}{\sqrt{\frac{(\sigma^2)^{\vee}}{n}}} \approx t_{4-1}$$

$$= \frac{0.0323695}{\sqrt{\frac{0.00254111}{4}}} = 1.284 \approx t_3 = 3.1825$$

This T-Statistic is less than the critical value of 3.1825. The validation on the Hang Lung Bank prediction model indicates that with the exception of one shipping company, the model may not be rejected.

TABLE 6.15 Residual Analysis for Hang Lung Bank

Company Name	Observed log P/E_i	Estimated log P/E_i	Residual (log P/E_i - log P/E_i)
Southeast Asia	1.13988	1.15855	-0.01867
Chung Wah Ship	0.94101	0.92166	0.01936
Federal Amalgamated Corp.	1.11394	1.07093	0.04301
Man Nin Inv.	1.11093	1.11682	-0.00590
Sandra Shipping	0.90309	0.93743	-0.03434
Sino Realty Enterprise	1.00647	1.00992	-0.00346
Luen Yick Manufactory & Property	0.94890	1.02173	-0.07283
Oceania Hawaii	1.00647	1.03373	-0.02726
Kam Shing Ind. Dev.	0.93298	0.95354	-0.02056
Ming Ren Inv. Ent.	0.94939	1.15855	-0.20916*
Kok Thai Ent.	1.10380	1.11009	-0.00629

Overseas Trust Bank

In 1970 - 1973, Overseas Trust Bank underwrote 16 issues which is 7.27% of the market in numbers of listings. Thirteen of the issues are solely underwritten by Overseas Trust Bank and three are sub-underwritings. In terms of value of underwriting, Overseas Trust Bank underwrote $88,905,000, being 2.43% of market share in value. It has an average participation value of $5,556,562 which are samples excluded from this study. The 12 samples are of industrial classifications as shown in Table 6.16.

TABLE 6.16 Industrial Classifications of Overseas Trust Bank Issues

Land	9	75%
Commercial	1	8%
Financial	2	17%
	12	100%

According to the date of the issue, the samples are divided into two groups as shown in Table 6.17, seven for the model construction and five for testing the model. Since there is only one commercial company in the sample, it is used for testing the model. The samples for the model construction are selected on the basis of industrial weightings.

TABLE 6.17 Grouping of Data of Overseas Trust Bank Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-Out Data for Model Testing
Land	75%	6	3
Commercial	8%	0	1
Financial	17%	1	1
	100%	7	5

During the period of study, the distribution of listings based on industrial classifications are shown in Table 6.18.

TABLE 6.18 Yearly Issues of Overseas Trust Bank by Industries

	1970	1971	1972	1973	Total
land	0	0	4	5	9
Commercial	0	0	0	1	1
Financial	0	0	1	1	2
	0	0	5	7	12

Selection of samples for model construction based on time sequence with the following different industries:-

Land 6 samples prior to 19th September, 1973.

Financial 1 sample prior to 23rd February, 1973.

Through least square analysis, the regression model assumes the linear form of :-

$$\log P/E_i = 1.08611 - 1.02023 \log DCOV$$

where DCOV is the forecasted dividend cover multiple.

TABLE 6.19 Pricing Model for Overseas Trust Bank

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover (log)	-1.02023	3.22	0.025

Residual Error	0.03833
Multiple Correlation (R)	0.821
R^2	0.674
Intercept Term (α)	1.08611
Degree of Freedom	5
Critical Value of T-Statistic with 5 d.f. at 0.05 level of significance	2.571
F-Statistic with 1 $d.f._1$ and 5 $d.f._2$	10.3579
Critical value of F-Statistic with 1 $d.f._1$ and 5 $d.f._2$ at 0.05 level of significance	6.6079

Variable not in Regression Set	T-Statistic
Net Asset Value per Share	1.36

From Table 6.19, it can be seen that the model constructed achieves a multiple correlation of 0.821 or a R^2 of 0.674. The significant variable, dividend cover, is significant at 0.025 level of significance with a T-Statistic of 3.22. The negative relationship between dividend cover and price-earnings multiple indicates that Overseas Trust Bank tends to rely on the dividend policy of the management of the company in pricing the new listings. In so doing, it tends to price shares at a lower level when the dividend payout is low compared with the earnings. A more generous dividend payout policy may lead to a higher pricing of the share.

Another more significant variable is the net asset value per share with a T-Statistic of 1.36. However, because of the limited sample size, this variable is less meaningful. With the exception of one company, all issues are made by Overseas Trust Bank when market interest rate is at 4.875% per annum and the market is both volatile and on the up-trend.

Since there are only 5 samples in the validation, the test for normality will not be meaningful. The residuals are assumed to have a normal distribution.

Using the F-Test on the validation samples,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{5-1,\ 5}$$

$$= \frac{0.00226196}{0.0014695}$$

$$= 1.539 \approx F_{4,5} = 5.1922$$

Thus, the F-Statistic is less than the critical value of 5.1922 ($F_{4,5}$)

Testing whether the residuals has a zero mean,

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} \approx t_{5-1}$$

$$= \frac{0.049183354}{\sqrt{\frac{0.00226196}{5}}}$$

$$= 2.312 \approx t_4 = 2.7764$$

Thus, the T-Statistic is less than the critical value, 2.7764, at 0.05 level of significance.

Hence, the model cannot be rejected.

However, examining the residuals of the validation test in Table 6.20, one company, Union Bank, accounts for most of the resulting residuals. But this high price of Union Bank is understandable due to the nature of the company. Bank licences in Hong Kong are restricted in issue and the goodwill of an established commercial bank like Union Bank should commend a high price. Therefore, it cannot be considered out of line at all when the unique nature of the business is taken into consideration.

TABLE 6.20

Residual Analysis for Overseas Trust Bank

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Intercontinental Housing	0.92065	0.93387	-0.01323
Lee On Realty	0.95856	0.92763	0.03093
Mercantile	0.96284	1.00165	-0.03881
Wah May Investment	1.02816	1.01655	0.01162
Asia Insurance	1.00000	0.94340	0.05660
Worldwide Properties	0.84011	0.87510	-0.03499
Kao Shing Property	0.98227	0.99439	-0.01212
Union V-Tex	0.90902	0.94663	-0.03760
Hong Kong Far East Credit	0.97772	0.99439	-0.01667
Hong Kong Macau Development	0.97313	0.98724	-0.01412
Union Bank	1.22401	0.90646	0.31755*
South-East Asia Investment	0.99476	0.99801	-0.00325

Bangkok Bank

In the period 1970 - 1973, new issues handled by Bangkok Bank amounted to $132,988,750, representing a market share of 3.63% in total value. The number of companies handled by Bangkok Bank is 13, which is 5.91 in terms of number of listings. These 13 companies represent industrial classifications as shown in Table 6.21.

TABLE 6.21 Industrial Classifications of Bangkok Bank Issues

Land	10	77%
Commercial	1	8%
Financial	2	15%
	13	100%

These 13 listings are divided into 2 groups, one of ten for the model construction and three for testing the model. Respectively, the samples are weighted and divided according to industrial classifications with subsequent listings for testing the model as shown in Table 6.22.

TABLE 6.22 Grouping of Data for Bangkok Bank Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-Out Data for Model Testing
Land	77%	9	1
Commercial	8%	0	1
Financial	15%	1	1
	100%	10	3

Base on industrial classifications, the listings from 1970-1973 are distributed as in Table 6.23.

TABLE 6.23 Yearly Issues of Bangkok Bank by Industries

	1970	1971	1972	1973	Total
Land	1	0	4	5	10
Commercial	0	0	1	0	1
Financial	0	0	1	1	2
	1	0	6	6	13

In dividing the samples for model construction, the following dates are used for the different industries:-

Land 9 samples prior to 7th March, 1973

Financial 1 sample prior to 23rd February, 1973

The only sample of commercial company, Stelux Manufacturing Ltd., is used for testing the model to see if the model, being constructed by Land and Financial samples, is appropriate for pricing the only commercial company.

The pricing model based on the ten samples take a linear form of: $\log P/E_i = 1.22892 - 1.67127 \log DCOV$

where DCOV is the forecasted dividend cover multiple.

From Table 6.24, the model constructed achieves a multiple correlation of 0.709 or a R^2 of 0.5027. The most significant variable is the dividend cover, with a T-Statistic of 2.84, i.e. better than 0.025 level.

Because of the limited size of the sample, the other variables are less meaningful, with total assets relatively more significant than asset mix. Nearly all issues, except one, are made when market conditions are both volatile and on the up-trend. Similarly, all issues except two are made when interest rate is at 4.875% per annum.

TABLE 6.24 Pricing Model for Bangkok Bank

VAriable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover (log)	-1.67127	2.84	0.025

Residual Error	0.09386
Multiple Correlation (R)	0.709
R^2	0.502
Intercept Term (α)	1.22892
Degrees of Freedom	8
Critical Value of T-Statistic with 8 d.f. at 0.05 level of significance	2.306
F-Statistic with 1 $d.f._1$ and 8 $d.f._2$	8.083
Critical value of F-Statistic with 1 $d.f._1$ and 8 $d.f._2$ at 0.05 level of significance	5.3177

Variables not in the Regression Set	T-Statistic
Asset Mix (log)	0.44
Net Asset Per Share (log)	0.03
Total Assets (log)	1.88
Market Interest Rate (log)	0.60
Volatility	0.60
Market Trend	0.60

With only 3 samples for testing, the test of normality will not be applied but normal distribution for the residuals will be assumed.

$$\bar{\epsilon} = \frac{1}{3} (0.22929) = 0.07643$$

Using the F-Test on the validation samples,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{3-1,\ 8}$$

$$= \frac{0.035694}{0.008810}$$

$$= 4.052 \approx F_{2,\ 8} = 4.459$$

Thus, the F-Statistic is less than the critical value of 4.459 ($F_{2,8}$)

To test whether the residuals have a zero mean, the T-Test is applied.

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} \approx t_{3-1}$$

$$= \frac{0.076428}{\sqrt{\frac{0.035694}{3}}}$$

$$= 0.70067 \approx t_2 = 4.3027$$

Thus, the T-Statistic is less than the critical value of 4.3027.

Hence, the model cannot be rejected. It is worth noting that the only commercial listing, Stelux Manufacturing, appeared to have been priced similar to land and financial shares, as its residuals so indicated.

From Table 6.25, the residual of the observed and the estimated price-earnings ratio in the model reveals two companies possessing relatively large residuals. The positive residuals indicate that the observed prices are higher than the prices estimated by the model. One company, Island Peninsula, is a real estimates company with good asset backing but the realisation period is delayed. Hence, the high price can be attributed to the good future prospects of the firm.

The other company, Union Bank, is a commercial bank. Its high price can be attributed to the goodwill of commercial banks in Hong Kong, whose licences are restricted in issue.

TABLE 6.25

Residual Analysis for Bangkok Bank

Company Name	Observed log P/E_i	Estimated $\widehat{\log P/E_i}$	Residual ($\log P/E_i - \widehat{\log P/E_i}$)
Asia Insurance	1.00000	0.99515	0.00485
Chiap Luen Ent.	0.83251	0.83953	-0.00702
China Engineer	0.98318	1.03849	-0.05532
Goldfield Realty	1.02531	1.06118	-0.03587
Huey Tai Inv.	1.00000	1.09057	-0.09057
Island Peninsula	1.31681	1.09057	0.22624*
Kai Tak Land Inv.	0.95856	1.00043	-0.04186
Liu Chong Hing	1.07041	1.03849	0.03191
Wai Yick Inv.	1.12937	1.18663	-0.05726
Wing Hung Kee Inv.	1.04139	1.01650	0.02490
Mai Hon Enterprise	1.07041	1.06118	0.00923
Union Bank	1.22401	0.93463	0.28939*
Stelex Manufacturing	1.00346	1.07279	-0.06933

Summary of Findings

The pricing models for smaller issuing houses are summarized in Table 6.26. The common variable used in all five models was the dividend cover variable. This variable, indicating the dividend policy of the issuing company, was also the most significant compared to the use of other variables - Oriental Financial Consultants at 0.001, Union Bank at 0.001, Hang Lung Bank at 0.005, Overseas Trust Bank at 0.025 and Bangkok Bank at 0.025. Possibly because of the fewer issues handled by these smaller underwriters, no other significant variable was detected, with the exception of the total assets variable present in the Oriental Financial Consultants model, with a significance level of 0.05.

The negative coefficient of the dividend cover variable indicated the relevance of the dividend pay-out policy towards pricing of the new issue. The inverse relationship revealed that if the proposed cash dividend pay-out is high, the issue can be priced higher correspondingly. This is in line with general expectations that the prospective investor is prepared to invest at a higher price if the investment can offer a higher return to capital. The total asset variable present at the Oriental Financial Consultants model had a positive coefficient signifying a direct relationship with price. The use of variables and the signs of coefficient revealed an unique pattern of pricing decision among these smaller issuing houses.

All five models attained F-Statistics meeting the prescribed level of 0.05. The explanatory power, R^2 ranged from 0.94 of the Union Bank model to 0.50 of the Bangkok Bank model.

Due to the smaller size of the hold-out data, the Kolmogorov-Smirnov Test of normality could not be meaningfully applied for testing these five models. However, the test of variance and the test for zero mean revealed that the respective hypotheses for Oriental Financial Consultants, Overseas Trust Bank and Bangkok Bank can be accepted. For the other two issuing houses, Union Bank and Hang Lung Bank, acceptance of these hypotheses can be made after the exclusion of certain unique samples. In particular, it can be pointed out that the Union Bank model was constructed with new issues of property companies only. When tested with property issues in the hold-out data, the model may not be rejected when one issue, Marvellous Investment Limited was excluded. For the Hang Lung Bank model, the exclusion of Ming Ren Investment Enterprise from the hold-out data would permit qualified acceptance of the model.

TABLE 6.26 Summary of Smaller Issuing House Models

	α	Pricing Model				F Stat.	R^2	Test on Hold-out Data		
		log TASS		log DCOV				Test of Normality	Test of Variance	Test For Zero Mean
		Coef.	S.L.	Coef.	S.L.					
Oriental Fin.	0.30	0.12	0.05	-1.33	0.001	A	0.81	I	A	A
Union Bank	1.09			-1.04	0.001	A	0.94	I	Q	Q
Hang Lung Bank	1.19			-1.71	0.005	A	0.92	I	Q	Q
Overseas Trust Bank	1.09			-1.02	0.025	A	0.67	I	A	A
Bangkok Bank	1.23			-1.67	0.025	A	0.50	I	A	A

A Hypothesis accepted with a significance level of 0.05.

Q Hypothesis accepted with qualifications.

I Inadequate data for meaningful testing.

α Intercept Term

Coef. Coefficient

S.L. T-Statistic Significance Level.

CHAPTER VII

EVALUATION MODELS : STOCK EXCHANGES

Pricing Model for Far East Exchange

The Far East Exchange was the largest stock exchange by value and number of listings which it admitted in the period of study. It admitted listings to a total value of $2,497,329,250, representing 18.12% of market in terms of value, and a total of 123 companies representing 55.91% of the market by number. The average listing value of the Exchange was $20,303,489, which was above the market average of $16,664,287. Of the 123 companies, one bank, one shipping, one commercial, 8 land and one investment companies are excluded from the study because of incomplete data. The only utility company, Cross Harbour Tunnel is not included in the model but will be tested as a separate case. In 1970-1973, their listings based on industrial classifications are distributed as shown in Table 7.1.

TABLE 7.1 Yearly Issues of Far East Exchange by Industries

	1970	1971	1972	1973	Total
Land	1	1	40	32	74
Textile	2	1	3	0	6
Commercial	0	1	5	4	10
Hotel	2	0	4	2	8
Shipping & Dock	0	0	5	5	10
Financial	0	0	0	2	2
	5	3	57	45	110

The listings are then weighted according to industrial classifications as shown in Table 7.2.

TABLE 7.2 Industrial Classifications of Far East Exchange Issues

Land	74	67%
Textile	6	5%
Commercial	10	10%
Hotel	8	7%
Shipping & Dock	10	9%
Financial	2	2%
	110	100%

The total 110 samples are then divided into groups of 89 and 21 for the construction of the pricing model and for validating the model respectively and each group is distributed using the industrial weightings as shown in Table 7.3.

TABLE 7.3 Grouping of Data of Far East Exchange Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-Out Data For Model Testing
Land	67%	59	15
Textile	5%	5	1
Commercial	10%	9	1
Hotel	7%	7	1
Shipping & Dock	9%	8	2
Financial	2%	1	1
	100%	89	21

Selection of the 89 samples for model construction is based on the date of prospectus with subsequent samples for testing. The following cut-off dates are used to construct the model:-

Land	59	smaples prior to 27th February, 1973.
Textile	5	samples prior to 28th December, 1972
Commercial	9	samples prior to 24th March, 1973.
Hotel	7	samples prior to 15th February, 1973
Shipping & Dock	8	samples prior to 6th April, 1973
Financial	1	sample prior to 24th August, 1973

The pricing model constructed from the 89 samples by multiple regression analysis assumes the relationship of:-

$$\log P/E_i = 1.10906 + 0.05064 \log TASS - 1.28668 \log DCOV - 0.51021 \log INT$$

where TASS is the size of the company given by the total assets of the firm,

DCOV, the forecasted dividend cover multiple,

and INT, the one year bank fixed deposit rate at the time of issue.

The pricing model, with these three significant variables, attains a multiple correlation coefficient of 0.731 or a R^2 of 0.5343.

TABLE 7.4 Pricing Model for Far East Exchange

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Total Assets (log)	0.05064	3.21	0.005
Dividend Cover (log)	-1.28668	9.25	0.001
Market Interest Rate (log)	-0.51021	2.07	0.05

Residual Error	0.06225
Multiple Correlation (R)	0.731
R^2	0.5343
Intercept Term (α)	1.10906
Degrees of Freedom	85
Critical Value of T-Statistic with 60 d.f. at 0.05 level of significance	2.00
F-Statistic with 3 $d.f._1$ and 85 $d.f._2$	32.5150
Critical value of F-Statistic with 3 $d.f._1$ and 60 $d.f._2$ at 0.05 level of significance	2.7581

Variables not in the Regression Set	T-Statistic
Asset Mix (log)	0.11
Net Asset per Share (log)	0.67
Market Volatility	1.47
Market Trend	0.83

From Table 7.4 the most significant variable is the dividend cover. With a T-Statistic of 9.25, it is significant at the 0.001 level of significance. The negative relationship of this variable with the price-earnings ratio indicates that when the dividend payout ratio is low, a correspondingly low price-earnings multiple for the new listing has to be fixed. This implies that the cash return to the investors is a consideration when the Far East admit stocks for listing.

The next significant variable is the size of a company. With a T-Statistic of 3.21, it is significant at the 0.005 level. The positive and direct relationship between total assets and the price-earnings ratio reveals that a higher price-earnings is permitted for company of a larger size. Of course, this concurs with the general expectation that a large company may generally be a better company and hence can command a higher price.

The market interest rate as a significant variable at the 0.05 level, shows a negative but direct relationship. This means that when the interest rate in the market is high, a correspondingly lower price-earnings ratio is required. The market interest rate can be considered the alternative opportunity rate of return to the investors. A lower price-earnings ratio means a higher return to the investors. It follows that the Far East Exchange expects a correspondingly higher return to the investors when the opportunity rate of return in the money market is higher.

Of the four other variables not in the regression set, market volatility is significant at the 0.2 level of significance. However, the marginal contribution to the multiple correlation coefficient (R) is small. The other three variables, asset mix, net asset per share, and market trend are quite insignificant in the pricing model. Applying the Kolmogorov-Smirnov Test to the hold-out samples, the D-Statistic of the Test shows a d_n of 0.7037 which is less than the critical value of 0.895 at 5%. This indicates that the residuals of the hold-out samples have a normal distribution.

Using the F-Test to test the error term of the validation, given by:-

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} \approx F_{21-1,\ 85}$$

$$= \frac{0.0037965}{0.003876} = 0.979 \approx F_{20,\ 120} = 1.6587$$

Thus, the F-Statistic is less than the critical value of 1.6587 $(F_{20,\ 120})$.

Applying the T-Test to examine whether the error term has a zero mean,

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} = \frac{0.0183997}{\sqrt{\frac{0.0037965}{21}}}$$

$$= 1.368 \approx t_{20} = 2.086$$

Thus, the T-Statistic is smaller than the critical value of 2.086, indicating $\bar{\epsilon}$ has a zero mean. Therefore, the validation proves that the model cannot be rejected.

Using the Kolmogorov-Smirnov Test for normality of the hold-out data, the D-statistic shows a d_n of 0.562 which is less than the critical value of 0.895 at the 5% level. This proves that the residuals of the hold-out samples do have a normal distribution.

Applying the F-Test to test the error term of the hold-out data,

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} = \frac{0.0076527}{0.0057499}$$

$$= 1.3309 \approx F_{9,19} = 2.4227$$

Since the F-Statistic, 1.3309, is less than the critical value, 2.4227, at 9-19 degrees of freedom with 0.05 level of significance, the test reveals that the error term of the hold-out data is not significantly different from that of the prediction model.

To examine whether the residual has a zero mean, the T-Test is used:-

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{\sigma^2}{n}}} = \frac{0.0120769}{0.0276635}$$

$$= 0.4366 \approx t_9 = 2.2622$$

Therefore, the T-Statistic, 0.4366, is less than the critical value of 2.2622 with 9 degrees of freedom at 0.05 level of significance. On the basis of the above 3 tests, the prediction model cannot be rejected.

Examining the residuals of the observations in the pricing model in Table 7.5, five samples reveal relatively large residuals. These companies are Union Bank, Murjani Holdings, Heng Sang Industries, Island Peninsula and Wing On (Life) Holdings.

For Union Bank, the positive relationship between the observed and the estimated price-earnings reveals premium pricing. The pricing for a commercial bank differs from the pricing in other industries, and the premium may be accounted for by the goodwill arising from the limited number of commercial bank lincences issued by the Hong Kong Government. The negative residual for the Murjani Holdings observation indicates an underpricing of the share. This may be explained by the nature of the company being an export trading company in possession of textile export quotas. These could be considered assets as long as voluntary trade restrictions were likely to continue, but if these arrangements changed, the earning power of the company might be affected. Hence, the shares was underpriced accordingly to reflect this uncertainty in its prospects.

The premium pricing of Island Peninsula Limited, a real estates developer, can be attributed to the realisation period of its investment returns. The company was in possession of a land lot, known as Baldwin Court in Waterloo Road, a high-class residential area. The site was considered valuable with good development prospects. However, it would take more than two years to realize a return on investment. Hence, the company was valued for its good prospects rather than its current position.

The positive pricing residual on Hang Seng Industries can be explained by the anticipated earnings of the company. In the first year after listing, the company had a price-earnings ratio of 8.90 but with 20% growth of earnings in the next year, the P/E ratio was 7.60. Hence, it was the increased earning prospects in the second year which reflected the initial overpricing.

Wing On Life Holding Limited reveals a large positive residual indicating a premium on the observed pricing. This can be accounted for by the good asset backing of the share. With an issue price of $2.80 per share, the net tangible assets per share is $3.44. Because of the nature of an insurance company, the net asset value of the firm was taken into consideration when pricing this company.

For the only utility company, Cross Harbour Tunnel Limited, the observed price-earning ratio has a large positive residual, indicating that the pricing model of the Far East Exchange may not be applicable to estimate this unique industry.

TABLE 7.5 Residual Analysis for Far East Exchange

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Allied Food Ind.	0.96520	1.05276	-0.08756
Anderson Holdings	0.96378	0.96264	0.00114
Asia Stone	0.90525	0.96166	-0.05640
Beauforte Holdings	1.06221	1.06834	-0.00613
Cedar Garment Factory	0.81888	0.76736	0.05152
Cheung Sun Dev.	0.94448	0.96769	-0.02321
Cheung Kong Holdings	1.00346	0.99605	0.00740
Chi Cheung Inv.	0.99694	1.03045	-0.03349
Chuangs Cutlery	0.90309	0.99304	-0.08994
Chuangs Dev.	1.00903	1.02083	-0.01180
Dah Yuen Estates	0.93348	0.99509	-0.06160
Estate Finance	0.97497	0.99316	-0.01819
Federal Amalgamated Corp.	1.11394	1.03938	0.07456
Fibres & Fabrics	0.81822	0.83857	-0.02035
Freedom Dev.	0.99122	1.02556	-0.03433
Fu Chip Inv.	0.97772	1.00990	-0.03218
Golden Hill	0.94939	0.89882	0.05056
Goldfield Realty	1.02531	1.00783	0.01747

TABLE 7.5 Residual Analysis for Far East Exchange (Cont'd.)

Company Name	Observed $\log P/E_i$	Estimated $\widehat{\log P/E_i}$	Residual ($\log P/E_i - \widehat{\log P/E_i}$)
Good Year Estates	0.77378	0.80741	-0.03362
Hang Lung Dev.	1.12646	1.09329	0.03316
Heng Sang Industry	0.94939	0.81434	0.13504 *
Highfield Sealand	0.78247	0.85174	-0.06927
Hip Shing Hong	1.00518	1.02451	-0.01933
Hong Kong Barge	0.99122	1.03528	-0.04405
H.K. Far East Credit	0.97772	1.01142	-0.03370
H.K. Kowloon Commercial	0.94694	0.96330	-0.01635
H.K. Macau Development	0.97312	0.99976	-0.02663
H.K. Optical	1.03743	1.00437	0.03305
Hopewell Holdings	1.07555	1.04546	0.03009
H.K. Properties	0.90902	0.95849	-0.04947
Hotel Fortuna	1.03743	0.97666	0.06076
Huey Tai Inv.	1.00000	1.01863	-0.01863
Imperial Hotel	0.99387	0.99924	-0.00537

TABLE 7.5 Residual Analysis for Far East Exchange (Cont'd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Inland Realty	1.05308	1.04126	0.01182
Intercontinental Housing	0.92064	0.97435	-0.05371
International Restaurant	0.96426	0.96837	-0.00411
International Maritime	1.14239	1.07683	0.06556
Island Peninsula	1.31681	0.97785	0.33895 *
Jan Sin Mee Garment	0.98900	1.00632	-0.01731
Kai Ming Investment	0.92993	0.99456	-0.06463
Kai Tak Land Inv.	0.95856	0.97325	-0.01469
Kailey Enterprise	1.06070	1.04558	0.01511
Kamcourt Dev.	0.97451	0.99907	-0.02456
Kam Shing Ind. Dev.	0.93298	0.94695	-0.01396
Kar Yau	0.98227	0.97962	0.00264
Keng Fong Sin Kee	0.96848	0.99894	-0.03045
Kien Shing Dev.	0.99519	1.01443	-0.01923
King Fung Dev.	1.05500	1.07603	-0.02103

TABLE 7.5 Residual Analysis for Far East Exchange (Cont'd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Kong Fat	0.89265	0.90870	-0.01604
Lai Sun Garment	0.92272	0.93254	-0.00981
Lam Soon	0.99122	0.97570	0.01552
Lee Hing Dev.	1.03822	0.99953	0.03869
Lee On Realty	0.95856	0.92999	0.02857
Liu Chong Hing	1.07041	1.03210	0.03830
Luen On Inv.	1.03743	1.04247	-0.00503
Magnificant Estates	1.04493	1.02655	0.01837
Manufacturers Inv.	1.09691	1.04693	0.04997
Mercantile	0.96284	1.02680	-0.06396
Murjani Holdings	0.87852	0.99393	-0.11540 *
New Star Dev.	1.01912	1.01074	0.00837
New World Dev.	1.14051	1.09895	0.04155

TABLE 7.5 Residual Analysis for Far East Exchange (Cont'd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Nylex Realty	0.78887	0.82849	-0.03961
Oceania Hawaii	1.00647	0.99884	0.00761
Pearl Island Inv.	0.91645	0.96836	-0.05190
Pokfulam Dev.	0.94349	0.97943	-0.03593
Property Enterprise	1.07918	1.03199	0.04719
Ruby Holdings	1.04532	1.04047	0.00484
Safety Godown	0.84880	0.81982	0.02898
Shun Fook Enterprise	0.97772	0.99096	-0.01323
Shun Tak Enterprise	0.94939	1.00551	-0.05611
Singtao Newspapers	1.04139	1.00447	0.03691
Siu On Realty	0.95085	0.99915	-0.04829
Stelex Mfg.	1.00346	1.02718	-0.02371
Sun Hung Kai Holdings	1.07041	1.02565	0.04475
Sutherland Estate	1.08350	1.02783	0.05567
Tai Cheung Property	1.04100	1.01179	0.02921

TABLE 7.5 Residual Analysis for Far East Exchange (Cont'd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Tai Sang Land Dev.	1.03902	1.02537	0.01364
Tai Shun Estates	1.00000	1.00408	-0.00408
Tung Hing Holding	0.79588	0.86066	-0.06478
Union Bank	1.22401	0.96712	0.25688 *
Uniworld Shipping	0.92324	0.94970	-0.02645
Wah Cheong Dev.	0.93951	0.92241	0.01710
Wah Kwong Shipping	1.08814	1.08202	0.00612
Wah May Investment	1.02816	1.03794	-0.00977
Wai Wah Enterprise	0.86923	0.90969	-0.04046
Wayson Dev.	0.93951	0.96234	-0.02282
Wei Woo Estates	1.03342	1.04156	-0.00813
Wing Cheung Shing	0.95133	0.96860	-0.01726
Wing Tai Dev.	0.94546	0.93437	0.01109

TABLE 7.5 Residual Analysis for Far East Exchange (Cont'd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Chiap Luen	0.83250	0.85417	-0.02166
City Urban Property	1.02775	0.99162	0.03613
Fu Fai Enterprise	0.93449	0.95830	-0.02380
Harilelas Properties	0.98677	1.01882	-0.03205
Luen Yick Mfg. & Pty.	0.94890	0.98187	-0.03297
Mai Hon Enterprise	1.07040	1.01207	0.05832
Marvellous Inv.	0.94200	0.99575	-0.05374
Mohans Property Inv.	1.06557	1.00105	0.06452
Nationwide Realty	0.99033	0.99162	-0.00128
Oxford Property Finance	0.97358	0.99532	-0.02173
South East Asia Inv.	0.99475	0.93016	0.06458
Trafalgar Housing	0.98407	0.99677	-0.01270
Wah Ha Realty	0.96848	0.98815	-0.01967
Wah Kwong Property	1.00000	0.99163	0.00836

TABLE 7.5 Residual Analysis for Far East Exchange (Cont'd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Unison Knitting	0.86332	0.90958	-0.04626
Chow Sang Sang	0.97358	0.97664	-0.00305
Li and Fung	1.12057	0.99682	0.12374 *
Park Hotel	1.07664	1.05121	0.02542
Orient Overseas	1.07918	1.04531	0.03386
Continental M. Inv.	1.03941	1.00504	0.03437
Wing On Life Holdings	1.16435	0.95836	0.20599 *

Pricing Model for Kam Ngan Stock Exchange

New Listings in which the Kam Ngan Stock Exchange admitted numbered 113 in the period of study, covering 51.36% of the companies listed and amounting to a value of $2,350,099,250 or 68.12% of the total market. The average size of the listings which the Kam Ngan Stock Exchange listed was $20,797,338, being high compared with the market average of $16,664,287. Of the 113 companies, one bank, one shipping, one commercial, eight land, and one investment companies are excluded from the study because of incomplete data. The only utility company, Cross Harbour Tunnel will only be used in the testing of the model to see whether the pricing model developed from other industries will be applicable in pricing this share of a different industry. The remaining 100 samples were listed according to industrial classifications in Table 7.6 .

TABLE 7.6 Yearly Issues of Kam Ngan Stock Exchange by Industries

	1970	1971	1972	1973	Total
Land	0	0	38	32	70
Textile	0	0	3	0	3
Commercial	0	0	5	4	9
Hotel	0	0	4	2	6
Shipping & Dock	0	0	5	5	10
Financial	0	0	0	2	2
	0	0	55	45	100

In Table 7.7 weightings are assigned to the individual industrial classifications to determine the significance of individual industries in the model:-

TABLE 7.7 Industrial Classifications of Kam Ngan Stock Exchange Issues

Land	70	70%
Textile	3	3%
Commercial	9	9%
Hotel	6	6%
Shipping & Dock	10	10%
Financial	2	2%
	100	100%

The 100 samples are then divided into two groups for the construction of the model and subsequent testing. Applying the weightings of the industrial classifications, 79 samples are used for the construction of the model and 21 for the testing as shown in Table 7.8.

TABLE 7.8 Grouping of Data of Kam Ngan Stock Exchange Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-out Data For Model Testing
Land	70%	55	15
Textile	3%	2	1
Commercial	9%	8	1
Hotel	6%	5	1
Shipping & Dock	10%	8	2
Financial	2%	1	1
	100%	79	21

Selection of samples for the model construction is based on the date of prospectus from 1970-1973 with the subsequent samples used for testing. Accordingly, the following cut-off dates are used for different industries in the model construction:-

Land	55 samples prior to 26th February, 1973.
Textile	2 samples prior to 28th December, 1972.
Commercial	8 samples prior to 24th March, 1973.
Hotel	5 samples prior to 15th February, 1973.
Shipping & Dock	8 samples prior to 13th August, 1973.
Financial	1 sample prior to 24th August, 1973.

From regression analysis, the model assumes a linear form of:

$$\log P/E_i = 0.71896 + 0.05607 \log TASS - 1.28633 \log DCOV$$

where TASS is the size of the company given by the total asset of the firm,

and DCOV is the dividend cover multiple of the firm.

The model constructed identifies two significant variables, total assets and dividend cover, as important variables in the pricing process. The equation achieves a correlation coefficient of 0.693 or a coefficient of multiple determination (R^2) of 0.48. No multi-collinearity exists through the step-wise regression.

TABLE 7.9 Pricing Model for Kam Ngan Stock Exchange

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Total Asset (log)	0.05607	3.47	0.001
Dividend Cover (log)	-1.28633	7.73	0.001

Residual Error	0.06232
Multiple Correlation (R)	0.693
R^2	0.48
Intercept Term (α)	0.71896
Degrees of Freedom	75
Critical value of T-Statistic with 60 d.f. at 0.05 level of significance	2.00
F-Statistic with 3 $d.f._1$ and 75 $d.f._2$	23.1159
Critical value of F-Statistic with 3 $d.f._1$ and 60 $d.f._2$ at 0.05 level of significance	2.7581

Variables not in Regression Set	T-Statistic
Asset Mix (log)	0.32
Net Asset per Share (log)	1.93
Trend	1.14
Market Interest Rate	0.00
Volatility	0.00

Of the two significant variables, the more significant variable is the dividend cover with a T-Statistic of 7.73 which has a level of significance better than 0.01 in Table 7.9. Its negative relationship with the price of a new listing indicates that listings are priced lower if the company management decides on a lower dividend payout ratio. From the standpoint of the investors, this means that a high reinvestment rate of profit will not lead to higher pricing of the issue but a high cash dividend payout policy will do so.

The other significant variable, total assets, is also significant at the 0.001 level. The positive coefficient means that the size of the firm has a direct impact in pricing. Thus, a relatively higher price can be acceptable for a larger size firm.

For variables not in the regression set, net asset per share is significant at the 0.1 level. However, their contribution to the R^2 is very marginal and hence they are not included in the model. Two other variables, market interest rate and volatility indicates that all issues were made in a volatile market when interest rates were stable. Since the stock exchange is only involved in admitting a new listing, it is for the underwriters to decide on the date of listing. It would be unrealistic to conclude that the Kam Ngan Stock Exchange will only permit listings in a volatile state of market. It may equally be unrealistic to say that the market interest rate has no bearing on the pricing of a new listing, as all the new listings were made in a period throughout which the bank interest rate remained stable at 4.875% per annum.

Applying the Kolmogorov-Smirnov Test to the residuals of the hold-out data, the D-Statistic shows a d_n of 1.094 which exceeds the critical value of 0.895 at the 5% level. This indicates that the hold-out samples do not have a normal distribution. A plausible explanation is that since Kam Ngan Stock Exchange often considered new issue admissions jointly with the Far East Exchange, this may affect the pricing of issues. In particular, in the model Kam Ngan admitted all the issues when the bank interest rate was stable and the market volatility was high. Thus, the pricing of issues in the Kam Ngan Stock Exchange might have been affected by decisions of the Far East Exchange. Using the F-Test to test the error term of the hold-out data, this is given by:-

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} = \frac{0.0037965}{0.003876}$$

$$= 0.979 \approx F_{20,85} = 1.6587$$

Since the F-Statistic, 0.979 is less than the critical value, 1.6587, at 20-85 degrees of freedom with 0.05 level of significance, the test shows that the error term from the hold-out data is not significantly different from that of the prediction model.

To further test whether the residual has a zero mean, we apply the T-Test by,

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} = \frac{-0.015417}{0.010406}$$

$$= 1.4815 \approx t_{20} = 2.086$$

Hence, the T-Statistic, 1.4815, is less than the critical value of 2.086 with 20 degrees of freedom at 0.05 level of significance. On the basis of the F-Test and the T-Test, the model cannot be rejected but some reservations to accept the model can be stated as the residuals were not normally distributed.

From the model, residuals of four samples are of significance in Table 7.10. These 3 companies are Heng Sang Industries Ltd., Island Peninsula, Union Bank and the Wing On Life (Holdings) Limited. All four samples reveal a positive residual indicating an excess of the observed price over the price estimated by the model. The explanation for the premium pricing of Union Bank may lie in the privilege and goodwill inherent in a commercial bank in Hong Kong. As discussed in the Far East Exchange pricing model, Island Peninsula and Hang Seng Industries are both valued at a premium because of their future earnings potential.

The residual of Wing On Life (Holdings) Limited is positive. Considering the good investment holdings of this established life insurance company in Hong Kong, the premium pricing may be necessary, as revealed by its net tangible asset backing of $3.44 against an issue price of $2.80 per share.

The only utility company, Cross Harbour Tunnel Limited does not have a large residual. This indicates that this pricing model is consistently applied to the pricing of the only utility company at a subsequent listing date of July, 1974.

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange

Company Name	Observed $\log P/E_i$	Estimated $\widehat{\log P/E_i}$	Residual ($\log P/E_i - \widehat{\log P/E_i}$)
Allied Food Industry	0.96520	1.05626	-0.09105
Anderson Holdings	0.96378	0.96355	0.00023
Asia Stone	0.90525	0.96378	-0.05853
Beauforte Holdings	1.06221	1.07147	-0.00926
Cheung Sun Dev.	0.94448	0.96869	-0.02421
Cheung Kong Holdings	1.00346	1.00055	0.00291
Chi Cheung Inv.	0.99694	1.03105	-0.03409
Chuangs Dev.	1.00903	1.02189	-0.01286
Dah Yuen Estates	0.93348	0.99674	-0.06325
Estate Finance	0.97497	0.99271	-0.01774
Federal Amalgamated Corp.	1.11394	1.03992	0.07402
Freedom Dev.	0.99122	1.02614	-0.03491
Fu Chip Inv.	0.97772	1.01077	-0.03304
Golden Hill	0.94939	0.89506	0.05432

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Goldfield Realty	1.02531	1.00944	0.01586
Hang Lung Dev.	1.12646	1.10113	0.02532
Heng Sang Industry	0.94939	0.81662	0.13276 *
Highfield Sealand	0.78247	0.85281	-0.07034
Hip Shing Hong	1.00518	1.02695	-0.02176
Hong Kong Barge	0.99122	1.03690	-0.04567
H.K. Far East Credit	0.97772	1.01197	-0.03424
H.K. Kowloon Commercial	0.94694	0.96338	-0.01643
H.K. Optical	1.03743	1.00367	0.03375
Hopewell Holdings	1.07555	1.05157	0.02397
H.K. Properties	0.90902	0.95984	-0.05082
Huey Tai Inv.	1.00000	1.01896	-0.01896
Inland Realty	1.05308	1.04251	0.01057
Intercontinental Housing	0.92064	0.97913	-0.05848
International Restaurant	0.96426	0.97034	-0.00608

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
International Maritime	1.14239	1.08290	0.05948
Island Peninsula	1.31681	0.97381	0.34299 *
Jan Sin Mee	0.98900	1.00871	-0.01970
Kai Ming Inv.	0.92993	0.99708	-0.06715
Kai Tak Land Inv.	0.95856	0.97618	-0.01762
Kailey Enterprises	1.06070	1.04627	0.01442
Kamcourt Dev.	0.97451	0.99926	-0.02475
Kam Shing Ind. Dev.	0.93298	0.94705	-0.01407
Kar Yau	0.98227	0.98008	0.00218
Keng Fong Sin Kee	0.96848	1.00007	-0.03158
Kien Shing Dev.	0.99519	1.01675	-0.02155
Kong Fat	0.89265	0.91055	-0.01789
Lai Sun Garment	0.92272	0.93574	-0.01301

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange (Contd.)

Company Name	Observed $\log P/E_i$	Estimated $\widehat{\log P/E_i}$	Residual ($\log P/E_i - \widehat{\log P/E_i}$)
Lam Soon	0.99122	0.97480	0.01642
Lee Hing Dev.	1.03822	1.00213	0.03609
Lee On Realty	0.95856	0.93085	0.02770
Liu Chong Hing	1.07041	1.03819	0.03221
Luen On Inv.	1.03743	1.04230	-0.00487
Magnificant Estates	1.04493	1.02724	0.01769
Manufacturers Inv.	1.09691	1.04672	0.05019
Mercantile	0.96284	1.02801	-0.06517
New Star Dev.	1.01912	1.00972	0.00939
New World Dev.	1.14051	1.10790	0.03260
Nylex Realty	0.78887	0.82921	-0.04033
Oceania Hawaii	1.00647	0.99804	0.00842
Pearl Island Inv.	0.91645	0.96988	-0.05342
Pokfulam Dev.	0.94349	0.98169	-0.03819

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Property Enterprise	1.07918	1.03275	0.04643
Ruby Holdings	1.04532	1.04265	0.00267
Safety Godown	0.84880	0.82168	0.02711
Shun Fook Enterprises	0.97772	0.99355	-0.01583
Shun Tak Ent.	0.94939	1.00966	-0.06027
Singtao Newspapers	1.04139	1.00760	0.03379
Siu On Realty	0.95085	1.00217	-0.05131
Stelex Mfg.	1.00346	1.02990	-0.02643
Sun Hung Kai Holdings	1.07041	1.03104	0.03936
Tai Cheung Properties	1.04100	1.01569	0.02530
Tai Sang Land Dev.	1.03902	1.03120	0.00781
Tai Shun Estates	1.00000	1.00481	-0.00480
Tung Hing Holdings	0.79588	0.86084	-0.06496
Union Bank	1.22401	0.97484	0.24916 *

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Uniworld Shipping	0.92324	0.94832	-0.02507
Wah Cheong Dev.	0.93951	0.92288	0.01663
Wah Kwong Shipping	1.08814	1.08915	-0.00101
Wah May Inv.	1.02816	1.03832	-0.01016
Wai Wah Ent.	0.86923	0.91125	-0.04202
Wayson Dev.	0.93951	0.96321	-0.02369
Wei Woo Estates	1.03342	1.04130	-0.00787
Wing Cheung Shing	0.95133	0.96879	-0.01745
Wing Tai Dev.	0.94546	0.93529	0.01017
Chiap Luen Ent.	0.83250	0.85765	-0.02514
Fu Fai Enterprises	0.93449	0.95962	-0.02512
Harilelas Pty.	0.98677	1.01918	-0.03240
H.K. Macau Dev.	0.97312	1.00002	-0.02689

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Luen Yick Mfg. Fty.	0.94890	1.01532	-0.06642
Mai Hon Enterprise	1.07040	1.04925	0.02115
Marvellous Inv.	0.94200	0.99653	-0.05452
Monhans Pty. Inv.	1.06557	1.03559	0.02998
Nationwide Realty	0.99033	1.02366	-0.03332
Oxford Property Finance	0.97358	1.03022	-0.05663
South-East Investment	0.99475	1.04303	-0.04827
Trafalgar Housing	0.98407	0.99907	-0.01500
Wah Ha Realty	0.96848	1.02275	-0.05427
Wah Kwong Property	1.00000	1.02986	-0.02986
Unison Knitting	0.86332	0.91112	-0.04780
Chow Sang Sang	0.97358	1.01143	-0.03784
Li and Fung	1.12057	1.03188	0.08868

TABLE 7.10 Residual Analysis for Kam Ngan Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Park Hotel	1.07664	1.05453	0.02210
Continental M. Inv.	1.03941	1.08326	-0.04384
Orient Overseas Containers	1.07918	1.08557	-0.00639
Wing On Life Holdings	1.16435	1.04622	0.11812 *

Pricing Model for Hong Kong Stock Exchange

In the period 1970 - 1974, Hong Kong Stock Exchange was involved in 59 listings to a total value of $2,097,155,270, representing 26.82% of the market share by number and 57.2% by value. The average value was $33,545,004, which was high compared with the market average of $16,664,287 per admission for the market as a whole.

Of the 59 companies, four were investment companies which are excluded from this study. Cross Harbour Tunnel Ltd., being the only utility company listed in the period is also excluded from the study, together with Hang Seng Bank whose financial data as revealed in the prospectus was inappropriate for the model construction. Hence, there is a total of 53 samples used in the study. The distribution of the new listings from 1970-1973 based on industrial classification is shown in Table 7.11.

TABLE 7.11 Yearly Issues of Hong Kong Stock Exchange by Industries

	1970	1971	1972	1973	Total
Land	6	0	7	5	18
Textile	5	1	5	0	11
Commercial	6	3	0	1	10
Hotel	2	1	0	0	3
Shipping & Dock	0	1	1	5	7
Financial	0	0	2	2	4
	19	6	15	13	53

The 53 samples used in the study, are weighted according to their industrial classification as shown in Table 7.12.

TABLE 7.12 Industrial Classifications of Hong Kong Stock Exchange Issues

Land	18	32%
Textile	11	22%
Commercial	10	20%
Hotel	3	6%
Shipping & Dock	7	13%
Financial	4	7%
	53	100%

The 53 samples are divided into two groups for construction of the model and testing, i.e. into 39 samples and 14 samples respectively. With the weightings of industrial classifications applied, the samples are selected for their purpose as shown in Table 7.13.

TABLE 7.13 Grouping of Data of Hong Kong Stock Exchange Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-out Data for Model Testing
Land	32%	13	5
Textile	22%	8	3
Commercial	20%	8	2
Hotel	6%	2	1
Shipping & Dock	13%	5	2
Financial	7%	3	1
	100%	39	14

Selection of the 39 samples for model construction is based on the date of prospectus from 1970 - 1973, with the subsequent 14 samples for testing. As a result, the following cut-off dates are used for different industries in the model construction:-

Land	13 samples prior to 7th March, 1973.
Textile	8 samples prior to 9th October, 1972.
Commercial	8 samples prior to 22nd November, 1971.
Hotel	2 samples prior to 1st Feburary, 1971.
Shipping & Dock	5 samples prior to 18th May, 1973.
Financial	3 samples prior to 24th August, 1973.

Using multiple regression analysis, the model takes the linear form of:-

$$\log P/E_i = 0.00537 - 0.05356 \log \text{ASMIX} + 0.12526 \log \text{TASS}$$

where ASMIX, or Asset Mix, is the ratio of current assets to net tangible assets of the new listings,

TASS is the size of the company given by the total assets of the firm.

The model constructed with the two significant variables attains a correlation coefficient of 0.718 or a coefficient of multiple determination (R^2) of 0.5155. No multi-collinearity exists through the step-wise regression.

TABLE 7.14 Pricing Model for Hong Kong Stock Exchange

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.05356	2.60	0.02
Total Assets (log)	0.12526	4.96	0.01

Residual Error	0.07013
Multiple Correlation (R)	0.718
R^2	0.5155
Intercept Term (α)	0.00537
Degrees of Freedom	36
Critical Value of T-Statistic with 30 d.f. at 0.05 level of significance	2.042
F-Statistic with 2 $d.f._1$ and 36 $d.f._2$	19.1035
Critical value of F-Statistic with 2 $d.f._1$ and 30 $d.f._2$ at 0.05 level of significance	3.3158

Variables not in the Regression Set	T-Statistic
Net Asset per Share (log)	0.44
Dividend Cover (log)	0.14
Market Interest Rate (log)	1.56
Volatility	1.35
Market Trend	0.36

As shown in Table 7.14 the most significant variable is total assets with a T-Statistic of 4.96, which is better than 0.01 level of significance. Its positive relationship with the price-earnigns multiple indicates that Hong Kong Stock Exchange tends to permit a higher price for companies of a larger size, as shown by total assets. This may be in line with the general concept of a large company being a better company and hence commands a higher price.

The significant variable, asset mix, is significant at the 0.02 level of T-Statistic. The negative relationship between asset mix and the price-earnings ratio indicates that for a company with a high current asset content, the Hong Kong Stock Exchange would expect a lower price-earnings to be fixed on the shares. This may be accounted for by the expectation that current assets may have lower earning power than other assets.

Two other variables, the market interest rate and market volatility, are significant at the 0.2 level. However, their contribution to the R^2 is small and hence they are not included in the pricing model. The three variables, net assets per share, dividend cover, and the market trend are insignificant as variables in the regression.

Applying the Kolmogorov-Smirnov Test to the residuals of the hold-out data, the D-statistic reveals a d_n of 0.558 which is less than the critical value of 0.895 at the 5% significance level. Thus, the residuals of the validation samples are normally distributed.

The F-Test for the error term of the hold-out sample takes the form of:-

$$\frac{(\sigma^2)^V}{(\sigma^2)^R} = \frac{0.0040658}{0.0049182}$$

$$= 0.82668 \approx F_{13,36} \fallingdotseq 1.9245$$

Since the F-Statistic, 0.82668, is less than the approximated critical value, 1.9245, at 15 and 40 degrees of freedom with 0.05 level of significance, this shows that the error term from the hold-out data is not significantly different from that of the prediction model.

Using the T-Test whether the residual has a zero mean, this takes the form of:-

$$\frac{(\bar{\epsilon})^V}{\sqrt{\frac{(\sigma^2)^V}{n}}} = \frac{-0.0089224}{\sqrt{\frac{0.0040658}{14}}}$$

$$= 0.52357 \approx t_{13} = 2.1604$$

Therefore, the T-Statistic, 0.52357, is less than the critical value of 2.1604 with 13 degrees of freedom at 0.05 level of significance. On the basis of the three tests, the prediction model for Hong Kong Stock Exchange cannot be rejected.

Of the residuals of the observed and the estimated price-earnings ratio in the model, three are relatively large in Table 7.15. These companies are Union Bank, Shipping General and Hong Kong Worsted Mills. For Union Bank, its goodwill as a commercial bank in Hong Kong probably commands a premium pricing than other industrial concerns. It is worth noting that in the models for its underwriters, Overseas Trust Bank and Bangkok Bank, the pricing of Union Bank throws up a big residual. Hence, the Union Bank can be considered unique in pricing.

Another company with a large residual is Shipping General. The premium pricing can be accounted for by the portfolio of the company. Besides shipping interests, Shipping General also has substantial foreign investments which causes its valuation to be different from the pricing of other Hong Kong shares. A third company with a large residual is Hong Kong Worsted Mills, a textile company. Although this sample reveals a price discount with the Hong Kong Stock Exchange model, no large residuals appear with the models of its two joint-underwriters, Schroders & Chartered and Jardine Fleming. This indicates that the stock exchange has accepted the pricing of the issuing houses although this differs from its own pricing norms. Furthermore, valuation of export quotas in a textile firm is difficult to standardize as future prospects are uncertain and the quotas vary between categories.

The only utility company, Cross Harbour Tunnel Ltd., does not assume a large residual when the prediction model is applied. Hence, the model appears to be applicable to the pricing of this utility company as well.

TABLE 7.15 Residual Analysis for Hong Kong Stock Exchange

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Asia Insurance	1.00000	0.97477	0.02522
Union Bank	1.22401	1.05706	0.16695 *
Wah Kwong Shipping	1.08814	1.10882	-0.02068
Shun Tak Enterprise	0.94939	1.03865	-0.08926
Orient Overseas Containers	1.07918	1.15590	-0.07672
New World Development	1.14051	1.15236	-0.01185
Hang Lung Dev.	1.12646	1.13478	-0.00832
Hong Kong Building Loan	1.06070	1.05092	0.00977
Shipping General	1.17782	1.02972	0.14810 *
Grand Marine	1.11327	1.08723	0.02604
Miramar Hotel	1.10003	1.07393	0.02609
Empress Hotel	0.88986	0.95572	-0.06586
Yangtzekiang Garment	0.90579	0.95711	-0.05132
Tajmahals	0.97312	0.90123	0.07189
Smart Shirt	0.88649	0.95750	-0.07100

TABLE 7.15 Residual Analysis for Hong Kong Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Nan Fung Textile	0.94300	1.00699	-0.06399
Mei Fung Fibre	0.95424	0.97662	-0.02238
Island Dyeing	0.97081	0.98721	-0.01640
Hong Kong Worsted Mills	0.77815	0.90256	-0.12440 *
Crocodile Garment	0.91169	0.95664	-0.04495
Cosmopolitan Properties	0.93449	0.89496	0.03953
Shui Hing	0.92531	0.97844	-0.05313
Shaw Brothers	1.01072	1.00195	0.00876
Pioneer Ind. Hldgs.	0.82347	0.91804	-0.09456
Metro Dodwell	0.96378	0.95887	0.00490
Lap Heng	0.84447	0.94079	-0.09632
Hutchison Boag	1.04100	0.94226	0.09873
General Bottling	1.00000	0.96376	0.03623

TABLE 7.15 Residual Analysis for Hong Kong Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Realty Dev.	1.08350	1.14103	-0.05752
Paul Y Construction	1.04139	0.98185	0.05953
Ocean Land Dev.	1.06296	1.08448	-0.02152
Hutchison Fung	1.11394	1.02291	0.09103
Hsin Chong Holdings	1.08279	0.99061	0.09216
Hong Kong Development	0.94939	0.98763	-0.03824
Harriman Holdings	1.04805	0.96162	0.08643
The Great Eagle	1.01326	1.05050	-0.03723
Gammon	1.00000	0.95693	0.04306
Cosmoploitan Properties	1.04218	1.00950	0.03267
China Engineering	0.98317	0.98463	-0.00145

TABLE 7.15 Residual Analysis for Hong Kong Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
City Urban Property	1.02775	1.17652	-0.14876
Wah Kwong Property	1.00000	1.10116	-0.10116
Mohans Pty. Inv.	1.06557	1.00634	0.05923
Mai Hon Enterprises	1.07040	1.07800	-0.00759
Unisouth	1.02734	1.01055	0.01679
Unitex	0.94890	0.98394	-0.03504
Easey Garment	0.97863	0.96971	0.00891
H.K. Carpet Mfg.	0.97680	0.98987	-0.01306
South China Morning Post	0.96848	0.92253	0.04594
Li and Fung	1.12057	1.02326	0.09730
Harbour Centre	1.06818	1.10998	-0.04179
Continental M. Inv.	1.03941	1.07940	-0.03998
Mutual Maritime	1.07298	1.07538	-0.00240
Wing On Life Holdings	1.16435	1.12764	0.03670

Pricing Model for Kowloon Stock Exchange

During 1970-1973, a total value of $265,159,000 of new listings was listed in the Kowloon Stock Exchange, being 7.23% of the market share in dollar value. This consists of 52 companies, representing 23.64% of the market in terms of number of listings. The average size of admission to the Kowloon Stock Exchange was $5,099,211, which was small compared with the market average of $16,664,287 per admission. Of the 52 companies, 8 investment companies, 3 land, 2 commercial and 2 shipping companies are excluded from the study because of insufficient data for analysis. As a result, a total of 32 samples are used in the study. Base on the different industrial classifications, the new listings are distributed as shown in Table 7.16.

TABLE 7.16 Yearly Issues of Kowloon Stock Exchange by Industries

	1970	1971	1972	1973	Total
Land	0	0	2	21	23
Textile	0	0	1	2	3
Commercial	0	0	0	4	4
Shipping & Dock	0	0	0	2	2
	0	0	3	29	32

In Table 7.17 weightings are assigned according to the proportion of the different industrial classifications to select samples for the model construction:-

TABLE 7.17 Industrial Classifications of Kowloon Stock Exchange Issues

Land	23	67%
Textile	3	8%
Commercial	4	15%
Shipping & Dock	2	10%
	32	100%

Two groups of samples are formed, one for the construction of the model and the other for validating the model, 22 and 10 samples respectively. Base on the weightings of industrial classifications, the companies are selected accordingly as shown in Table 7.18.

TABLE 7.18. Grouping of Data of Kowloon Stock Exchange Model Construction and Testing

	Weights(%)	Data for Model Construction	Hold-out Data For Model Testing
Land	67%	59	15
Textile	5%	5	1
Commercial	10%	9	1
Hotel	7%	7	1
Shipping & Dock	9%	8	2
Financial	2%	1	1
	100%	89	21

Selection of the 22 samples to construct the model is based on date of issue with subsequent listings for validating the model. The following dates are used to divide the samples into the two groups:-

Land	17 samples prior to 28th February,1973.
Textile	2 samples prior to 9th February,1973.
Commercial	2 samples prior to 28th February,1973.
Shipping & Dock	1 sample prior to 24th February, 1973.

Be regression analysis, the model assumes the linear form of:-

$$\log P/E_i = 0.99828 - 0.05859 \log ASMIX - 0.40091 \log DCOV$$

where ASMIX, or Asset Mix, is the ratio of current asset to net tangible assets of the new listings,

and DCOV, is the forecasted dividend cover multiple as determined by the dividend policy of the firm.

In Table 7.19 , the model constructed with the two significant variables achieves a correlation coefficient of 0.727 or a coefficient of multiple determination (R^2) of 0.5285. The most significant variable, dividend cover, has a T-Statistic of 3.11, which is better than 0.01 level of significance. Its negative relationship with the price-earnings multiple indicates that Kowloon Stock Exchange tends to admit a company with a high dividend payout multiple at a proportionally higher price. Another significant variable, asset mix, is significant at the 0.02 level of T-Statistic. The negative coefficient of the asset mix indicates that a low price-earnings multiple is expected for companies with a high current asset content in its net tangible assets. This may be explained by the plausible assumption that current assets may have lower earning power than other assets in the net tangible assets category.

Two other variables, net asset per share and the size of the company are insignificant. The other three variables, the market interest rate, the volatility of the market and the market trend are not relevant since all listings of the Kowloon Stock Exchange were made when the market conditions were volatile and on the up-trend; and the bank fixed deposit rate remained stable at 4.875% per annum.

TABLE 7.19 Pricing Model for Kowloon Stock Exchange

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.05859	2.74	0.02
Dividend Cover (log)	-0.40091	3.11	0.01

Residual Error	0.07582
Multiple Correlation (R)	0.727
R^2	0.5285
Intercept Term (α)	0.99828
Degrees of Freedom	19
Critical Value of T-Statistic with 19 d.f. at 0.05 level of significance	2.09
F-Statistic with 2 $d.f._1$ and 19 $d.f._2$	10.6197
Critical value of F-Statistic with 2 $d.f._1$ and 19 $d.f._2$	3.5219

Variables not in Regression Set	T-Statistic
Net Asset Per Share (log)	0.43
Total Assets (log)	0.53

All listings were made when interest was 4.875% per annum and market was volatile and on an up-trend.

Of the residuals of the model, 6 are relatively large in Table 7.20. Three property companies, Howard Land Investment Limited, Lucky Man Enterprise Limited and Yu Hing Holdings Limited assume a large positive residual, indicating higher observed price than estimated by the model. Two other property companies, Essential Enterprise Limited and Siu King Cheung Limited, plus a manufacturing company, Chesterfield Manufacturing Limited, have negative residuals, indicating discounts from the estimated price-earnings from the model. However, no special reason can account for such divergence from the pricing model for each of these companies.

TABLE 7.20 Residual Analysis for Kowloon Stock Exchange

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Alexander Knitter	0.92064	0.96473	-0.04408
Apollo Tours	1.02119	0.99918	0.02200
Chung Wah Ship	0.94101	0.96483	-0.02382
Creative Investment	1.07918	0.99050	0.08867
Dart Development	1.12385	1.16227	-0.03842
E Tung	1.13033	1.06813	0.06219
Essential Enterprise	0.83250	0.96022	-0.12771 *
Fraternal Dev.	0.90145	0.99657	-0.09511
Hin Kong Land Inv.	0.94398	0.95253	-0.00854
Hon Kwok Land Inv.	1.07918	1.10281	-0.02362
Howard Land Inv.	1.00173	0.83668	0.16504 *
International Industries	1.14922	1.09145	0.05776
Lucky Man Ent.	1.14613	1.04533	0.10079 *

TABLE 7.20 Residual Analysis for Kowloon Stock Exchange (Contd.)

Company Name	Observed $\log P/E_i$	Estimated $\log \widehat{P/E_i}$	Residual ($\log P/E_i - \log \widehat{P/E_i}$)
Man Nin Investment	1.1109	1.10454	0.00638
Rose Knitting	0.9329	0.96022	-0.02724
Siu King Cheung	1.0791	0.99897	0.08021
Union Globe Dev.	0.9912	1.02524	-0.03401
Wai Yick Inv.	1.1293	1.07344	0.05592
Winfair Inv.	0.8808	0.92540	-0.04458
Winland Inv.	1.0572	1.07418	-0.01689
Y Lee Enterprises	0.9675	1.02858	-0.06103
Yuen Sang Hardware	0.8109	0.90480	-0.09389
Harbour Engineering	0.9675	0.97831	-0.01076
Kok Thai Enterprise	1.1038	1.02889	0.07490
Southeast Asia	1.1398	1.04498	0.09489
Sun On Estates	1.1162	1.07518	0.04109

TABLE 7.20 Residual Analysis for Kowloon Stock Exchange (Contd.)

Company Name	Observed log P/E_i	Estimated log $\widehat{P/E_i}$	Residual (log P/E_i - log $\widehat{P/E_i}$)
Wing Hung Kee Inv.	1.04139	0.95367	0.08771
Yu Hing Holdings	1.09166	0.98566	0.10600*
Far East Wool	0.90417	0.93709	-0.03291
Chesterfield Mfg.	0.84633	0.95822	-0.11188*
Whitman Enterprise	1.07188	1.05492	0.01695
Siu King Cheung	0.90308	1.04831	-0.14522*

Summary of Findings

Findings based on the construction of pricing models for the four stock exchanges are shown in Table 7.21. These pricing models reflected the pricing evaluation of the stock exchanges when admitting a new issue. Results of the analysis showed that variables of evaluation differed between stock exchanges.

From Table 7.21, the Far East Exchange and the Kam Ngan Stock Exchange models both used the size of company and the dividend cover variables as the most significant variable. Furthermore, the coefficients and their respective signs were similar - for total asset, it was 0.05 for the Far East, significant at 0.005 level, and the coefficient for Kam Ngan is 0.06, significant at the 0.001 level; with the dividend cover variable, coefficients of both stock exchanges were -1.29, at 0.001 level of significance. For the Far East Exchange model alone, the market interest rate variable was significant at the 0.05 level with a coefficient of -0.51. It can thus be seen that the two models are similar. This can be explained by the fact that during this period, the Listing Sub-Committees of these two stock exchanges often held joint discussion meetings when considering admissions. Although there were occasional disagreements which resulted in the refusal of admission by one exchange, most issues were admitted simultaneously to both exchanges. Furthermore, the presence of the market interest rate variable in the Far East model can be accounted for by the longer history of this exchange. Since new issues were admitted

to the Far East Exchange before the establishment of Kam Ngan Stock Exchange, particularly at that time, interest rate did fluctuate in the beginning of the period, 1970 - 1973. Thus, the presence of this variable in the Far East model is understandable.

Unlike the Far East and Kam Ngan, issues on the Hong Kong Stock Exchange are not listed on the Kowloon Stock Exchange, and vice versa. At the same time, variables used were also different. For the Hong Kong Stock Exchange, the most significant variable was the total asset variable, with a coefficient of 0.13 at 0.001 significance level, and the next significant was the asset mix variable, with a coefficient of -0.05 at 0.02 level of significance. This reflected the emphasis placed on total assets and the asset content which the Hong Kong Stock Exchange considered when admitting a new issue. In the Kowloon Stock Exchange model, the most significant variable was dividend cover, with a coefficient of -0.4 at 0.01 level of significance, and the other significant variable was asset mix, with a coefficient of -0.06 significant at the 0.02 level. It should also be noted that the average size of listings on the Hong Kong Stock Exchange was much larger than that of the Kowloon Stock Exchange, whose sizes were $35,545,004 and $5,009,211 respectively.

As revealed by the F-Statistic, the four evaluation models met the specified significance level of 0.05. In terms of the explanatory power (R^2) of the models, all four attained a level of around 0.5. The R^2 of the Far East Exchange and Kowloon Stock Exchange models were 0.53 while Hong Kong and Kam Ngan were 0.52 and 0.48 respectively.

When tested with the hold-out data, three out of the four models passed the three tests of normality, variance, and zero mean. The only exception was the residuals of the hold-out data of Kam Ngan Stock Exchange not having a normal distribution, as indicated by the Kolmogorov-Smirnov Test. The Kam Ngan model could be accepted since the test of variance and zero mean both indicated results for acceptance. With some qualifications on the Kam Ngan model, the four evaluation models can be accepted.

TABLE 7.21 Summary of Stock Exchange Models

	α	Log ASMIX		Log TASS		Log DCOV		Log INT		F Stat.	R^2	Test of Normality	Test of Variance	Test of Zero Mean
		Coef.	S.L.	Coef.	S.L.	Coef.	S.L.	Coef.	S.L.					
FAR EAST	1.11			0.05	0.005	-1.29	0.001	-0.51	0.05	A	0.53	A	A	A
KAM NGAN	0.72			0.06	0.01	-1.29	0.01			A	0.48	Q	A	A
HONG KONG	0.005	-0.05	0.02	0.13	0.001					A	0.52	A	A	A
KOWLOON	1.00	-0.06	0.02			-0.4	0.01			A	0.53	A	A	A

A Hypothesis accepted with a significance level of 0.05.

Q Hypothesis accepted with qualifications.

I Inadequate data for meaningful testing.
Intercept Term.

Coef. Coefficient.

S.L. T-Statistic Significance level.

CHAPTER VIII

ANALYSIS OF THE PRICING MODELS

Comparison of Pricing Models of Issuing Houses

Examining the pricing models for both large and small issuing houses in Table 8.1, it can be observed that the R^2 differs for individual models. With coefficients of multiple determination of over 90%, the more predictive models are Union Bank and Hang Lung Bank. Three models demonstrate predictive power between 75% to 85%. They are Jardine Fleming, Schroders & Chartered and Oriental Financial Consultants. Two models are predictive at the 65% - 70% level, being Hang Seng Bank and Overseas Trust Bank. The two least predictive, between 48%-55% are Wardley and Bangkok Bank.

There seems to be no clear distinction in terms of predictive power between the larger issuing houses or the smaller ones. However, the majority of the pricing models achieves an R^2 of over 75%.

Turning to the explanatory variables used by the issuing houses, it appears that the market condition variables are least used. Of the nine issuing houses studied, only one issuing house, Schroders & Chartered considered the volatility of the market as a variable in pricing. Since the market conditions are defined to indicate short-term outlook of the market, it thus appears that the issuing houses did not consider this short-term element in their price determination processes.

The market interest rate indicated by the bank rate for one year fixed deposit can be looked upon as a measure of investment alternative open to the investors, since an investor can invest in fixed yield deposit with a commercial bank rather than investing in shares. A comparison between the pricing models indicates that Wardley is the only issuing house which considers interest rates in its pricing process. On the other hand, perhaps, a lack of samples for the other underwriters is the cause for not demonstrating that interest rates were taken into consideration. Since between October 11, 1971 and March 1, 1973, the bank interest rate remained stable at 4.875% per annum, and the majority of the issues were made during this period.

Three of the remaining four variables are mainly concerned with assets of the firm. Of the three "asset variables", the most frequently used was the size of the firm as given by the total assets of the firm. Included in total assets are net tangible assets as well as assets acquired by loan capital. The leading five issuing houses, Wardley, Jardine Fleming, Schroders and Chartered, Hang Seng Bank, and Oriental Financial Consultants are shown to have given considerable attention to total assets as a variable in price determination. The relationship was positive, which means that the larger companies were priced higher than the smaller.

Another significant variable is asset mix, given by the ratio between current assets and net tangible assets. Three issuing houses, Wardley, Jardine Fleming and Hang Seng Bank are shown to consider this variable with a negative coefficient indicating that a high current asset content would lead to a correspondingly lower pricing of the new issue. Or reversely, a company with a high net tangible asset content would be priced correspondingly higher. The third variable, net asset per share, is significant only for Schroders & Chartered. Its positive coefficient indicates that the higher the net asset per share the higher the share will be priced. Since the net asset values of properties are given by a professional valuer and certified by an accountant, this variable can be considered an indication of the liquidation value of the share at market prices.

The last variable to be discussed is the dividend cover as indicated in the prospectus. It discloses the expected dividend policy for the coming year by management of the company. Although it is expressed only as a one year figure, sometimes two, it can be considered an indication of the dividend payout policy determined by the Board of Directors taking into consideration the cashflow position of the firm and the expected yield to the investors plus the policy of reinvestment for profit. Of the nine issuing houses, six, including Wardley, Oriental Financial Consultants, Union Bank, Hang Lung, Overseas Trust Bank and Bangkok Bank are all shown to have considered this variable in their pricing process. The negative coefficient in all pricing

models indicates that the issuing houses tend to price higher the companies with a higher dividend payout policy. This reflects the belief in the importance of the cash yield to investors in contrast to the expectation of increased reinvestment of profits.

In reviewing the various pricing models, one important observation is that all models revealed one or more significant variables with reasonable predictive power. This means that the pricing process by each issuing house was based on a consistent pattern of thought. Moreover, the fact that market conditions are not significant variables in most of the models reflect the lack of considerations to short-term market conditions. It appears that the issuing houses have concentrated on the more long-term variables in terms of asset value and dividend policy, because although dividend policy as used in this study is for one year only, it is likely that such a policy will be continued. This further implies that perhaps the market discount which is subjected to short-term price movements or stags, is not of great concern to the issuing houses.

TABLE 8.1

SUMMARY OF PRICING MODELS FOR ISSUING HOUSES

NAME	INTERCEPT TERM α	ASSET MIX (log)	NET ASSET PER SHARE (log)	TOTAL ASSET (log)	DIVIDEND COVER (log)	INTEREST (log)	VOLATILITY	TREND	R^2
Wardley	0.79	-0.05		0.07	-0.51	-0.46			0.55
Jardine	-0.25	-0.08		0.15					0.74
Schroders & Chartered	-0.02		0.17	0.10			0.13		0.79
Hang Seng	0.18	-0.08		0.10					0.69
Oriental Financial Consultants	0.30			0.12	-1.33				0.81
Union Bank	1.09				-1.04				0.94
Hang Lung	1.19				-1.71				0.92
Overseas Trust	1.09				-1.02				0.67
Bangkok Bank	1.23				-1.62				0.50

Comparison of Pricing Models of Stock Exchanges

Undoubtedly, the price of new issues is primarily determined by the issuing houses, and by large, the pricing reflects the issuing houses' estimated market expections of the new listings. To a certain extent, it reflects the level at which the underwriters themselves are willing to invest in the company. However, the stock exchanges served as a constraint in the pricing process, since they scrutinized and evaluated objectively the pricing of each application. It is certainly true that the stock exchanges were not involved in the precise pricing of a share but they were concerned with the listing of a share which could affect their reputation. Hence, although there is no specific provisions about pricing in the stock exchange requirements, it can be assumed that an acceptable price is one of the unwritten requirements for admission. As a result, it can be assumed that the stock exchanges do have a set of requirements for pricing even though it is not expressly provided. The pricing models for stock exchanges can help prospective listing companies as well as issuing houses to visualize the different pricing requirements of different stock exchanges; and they are intended to meet this objective.

In Table 8.2, the models of the four stock exchanges reveal similar explanatory power, with coefficients of multiple determination (R^2) from 48% to 53%. Their explanatory power seems to be lower than that for the models of issuing houses. A plausible explanation for this would be the tolerance of stock exchanges in accepting different pricing characteristics of different issuing houses.

TABLE 8.2

SUMMARY OF PRICING MODELS FOR STOCK EXCHANGES

NAME	INTERCEPT TERM α	ASSET MIX (log)	NET ASSET PER SHARE (log)	TOTAL ASSET (log)	DIVIDEND COVER (log)	INTEREST (log)	VOLATILITY	TREND	R^2
HONG KONG	0.005	-0.05		0.13					0.52
FAR EAST	1.11			0.05	-1.29	-0.51			0.53
KAM NGAN	0.72			0.06	-1.29				0.48
KOWLOON	1.00	-0.06			-0.4				0.53

For if the stock exchanges imposed a set of stringent pricing requirements, the explanatory power (R^2) of their pricing models should be higher than those of the issuing houses, not vice versa. Nonetheless, the presence of significant variables in all four stock exchanges' models indicates that shares are not admitted randomly and there is some degree of consistency between the exchanges.

The variable, dividend cover, is significant in three stock exchanges, the Far East, Kam Ngan and Kowloon. Dividend cover is a ratio often provided in company prospectus. It reflects the expected level of dividends in the next year and the dividend policy of management, taking into consideration the cashflow position and a rate of return satisfactory for the prospective investors. The negative sign of the coefficient for this variable indicates that the three stock exchanges expect a high level of dividend to justify a higher price for the new issue. Thus, the three models reflect the belief that an adequate cash return to the investors is an investment philosophy of these three exchanges as well as the issuing houses. From the pricing models of the issuing houses, it appears that greater attention to this variable is given by the smaller underwriters and is accepted by the stock exchanges.

Another significant variable in the pricing models of three stock exchanges is the size of the company. The size is given by the total assets of the firm, as derived from net tangible assets, current liabilities and deferred liabilities. The positive sign of the coefficient indicates that the size of the firm has a direct relationship on the pricing of the issue, which means the larger the company, the higher it could be priced. This also coincides with the general expectation that a larger company is usually a better managed company and hence it can be higher priced. Furthermore, a larger company usually is better known, and a price premium can be added based on the implied goodwill. The consistency of the sign of the coefficient of this variable in the Hong Kong, Far East and Kam Ngan Stock Exchanges shows the concensus of this philosophy.

Another variable significant in two stock exchanges is the asset mix of the new listings. Asset mix is indicated by the ratio of current assets to the net tangible assets of the firm. This variable is significant in the Hong Kong and Kowloon Stock Exchanges, and the negative sign signifies that a company with a large current asset content in its net tangible assets is priced proportionally lower. This implicitly reflects the belief that the earning power of current assets in the net tangible assets may be less than that of other kinds of assets.

Market interest rate as a variable is only significant in the Far East Exchange model. For the Kam Ngan and Kowloon Stock Exchanges, it was not tested sufficiently, since the market interest rate remained stable at 4.875% per annum when shares are listed on these two stock exchanges. On the Hong Kong Stock Exchange, however, listings were made when the interest rate fluctuated so it seems that this variable was not taken into account in its pricing process. Interest rate as a variable indicates the opportunity rate of return as an alternative to investment in the new shares. Of course, the use of this rate of return has its limitations since it represents investment with a different risk dimension. Compared to investments in new issues, bank deposits yield a fixed interest but this tends to be lower in the long run than the return on the new shares because the risk of capital pertaining to a new issue investment is greater. As might be expected, this variable in the Far East Exchange pricing model assumes a negative relationship with price-earnings, so that when the market interest rate is high, the price of the new issue has to be set correspondingly lower so as to permit a higher rate of return on investment to the prospective investors. This is in line with the general expectation that when the opportunity rate of return is high, the investor will expect a higher rate of return when investing in a new issue.

The variable, net asset per share, is not significant in any of the four models. Since this value is based on valuations by independent professional valuers, it presumably reflects what the market value would be if the company were in liquidation. During the period of study, the market was buoyant leading to the general expectation that the inherent earning power of a company should be higher than its liquidation value, so it was not the net asset value that was important when considering the price of a new issue, but rather the potential earning power of the company.

The two market variables, volatility and market trend, are not significant variables in the pricing of the shares. This can perhaps be explained on the grounds that the underwriters may prefer listings to be made when the market is on the up-trend and is building up public expectations but from the models the short-term market conditions played little part in the pricing of the shares. In a way, this confirms the view that stock exchanges like issuing houses takes a long-term view when considering the price of a share. This finding runs counter to the widely held expectation that shares can always be sold in any market conditions if the price is adjusted accordingly. It is appropriate at this stage to examine the number of flotations in various market conditions.

Table 8.3 reveals that 87.7% of the issues are floated in a high volatile market and 82.6% are issued in a rising market trend, as shown in Table 8.4.

TABLE 8.3 Analysis of Market Volatility for Flotations 1970 - 1973

Market Volatility	No. of Issues Floated	
Low Volatile Market	27	12.3%
High Volatile Market	192	87.7%

TABLE 8.4 Analysis of Market Trend for Flotations 1970 - 1973

Market Trend	No. of Issues Floated	
Falling	38	17.4%
Rising	181	82.6%

The two market conditions, volatility and trend can be cross-tabulated to indicate the popularity of the 4 market states.

TABLE 8.5 Flotations in the 4 Market States 1970 - 1973

No. of Flotations (Percentage of Total) Trend \ Volatility	High Volatile	Low Volatile
Up	168 (76.7%)	13 (5.9%)
Down	24 (11.0%)	14 (6.4%)

From Table 8.5, flotations were thus concentrated in periods of high market conditions on the up-trend. These accounted for 76.7%. The other three market states were less favourable for flotation with 11.0% in high-volatile down trends, 5.9% in low-volatile up-trends and 6.4% in low-volatile down market conditions.

The high percentage of flotations in an up-trend market with high volatility may explain the apparent anomaly that pricing is not related to market conditions.

The market conditons will govern the timing of the issue but will not materially affect the level of pricing.

The Influence of Stock Exchange on Pricing

Throughout the pricing process, the issuing houses are dominant in the determination of the price of the new issues. Since in Hong Kong the issuing house is also the underwriter of the issue, the pricing should be of great concern to the issuing house. After all, the failure to set a fair price on a share will not only involve a loss of reputation to the issuing house but also financial losses to it as an underwriter.

However, it is at least realistic that the stock exchanges should also impose some requirements of pricing, not formally expressed, thus putting a constraint on the flexibility of price setting by the issuing houses. The pricing model developed for the stock exchanges serves to summarize the variables contained in the implicit requirements. On the other hand, the pricing models of the issuing houses reflect a set of considerations given by the issuing houses. These two sets of considerations by the two parties may represent counter-acting forces in the pricing decision.

To examine the two interacting forces, it will be necessary to examine the residual of the models. There are four possible combinations. A new issue can have small residuals in both the issuing house and the stock exchange model, or secondly, large residuals in both models, or thirdly, large residuals in the issuing house model but not the stock exchange, or vice versa. These 4 categories will be named, A, B, C, D, respectively, as shown in Table 8.6.

TABLE 8.6 Residuals Between Models of Issuing Houses and Stock Exchanges

Issuing Houses \ Stock Exchanges	Significant	Insignificant
Significant	B	C
Insignificant	D	A

Category A is straight forward. It simply means that without large residuals in both models, the pricing of the new issues would be acceptable to both issuing houses and stock exchanges. In category B, the pricing of a new listing reveals significant residuals in both models, the company or the nature of the company can be considered special for not adhering to the pricing norm of the two institutions. The listing of the share indicates the acceptance of the deviation by both parties. For category C, where the residual is large for the issuing house and not for the stock exchange, it shows that the stock exchange has imposed a pricing constraint on the issuing house so that the resultant pricing adheres to the stock exchange model but not the issuing house model. In category D, where the final pricing of an issue does not reveal a residual significant in the issuing house but significant in the stock exchange's model, it demonstrates that the stock exchange accepts the issuing house standard of price setting, thus causing price deviations from the stock exchange model. The residuals of the issuing houses and stock exchanges are summaried in Table 8.7.

TABLE 8.7 ANALYSIS OF RESIDUALS BETWEEN ISSUING HOUSES AND STOCK EXCHANGES

		FAR EAST		KAM NGAN		HONG KONG		KOWLOON	
		Significant	Not Significant	Significant	Not Significant	Significant	Not Significant	Significant	Not Significant
Wardley	Significant	Wing On Life Li & Fung	Safety Godown	Wing On Life Li & Fung	Safety Godown	Shipping General	Hutchison Boag Li & Fung Wing On Life		
	Not Significant	Murjani							
Jardine Fleming	Significant		Wah Kwong Property		Wah Kwong Property		Hsin Chong Wah Kwong Property		
	Not Significant	Murjani				H.K. Worsted Mills			
Schroders & Chartered	Significant	Li & Fung	City Urban		Li & Fung	Shipping General	City Urban Li & Fung		
	Not Significant					H.K. Worsted Mills			
Hang Seng	Significant								
	Not Significant	Murjani							

TABLE 8.7

ANALYSIS OF RESIDUALS (Cont'd)

		FAR EAST		KAM NGAN		HONG KONG		KOWLOON	
		Significant	Not Significant	Significant	Not Significant	Significant	Not Significant	Significant	Not Significant
Oriental Financial Consultants	Significant								New Era Aldeander Knitting
	Not significant							Essential Lucky Man Yu Hing Hldg. Chesterfield Siu King Cheung	
Hang Lung	Significant								Ming Ren
	Not significant								
Overseas Trust Bank	Significant	Union Bank		Union Bank		Union Bank			
	Not significant								
Bangkok Bank	Significant	Union Bank Island Peninsula		Union Bank Island Peninsula		Union Bank			
	Not significant								

Analysing the five significant residuals in the Wardley model, Wing On Life (Holdings) Co. Ltd. reveals premium pricing in the Far East and Kam Ngan models but not in the Hong Kong Stock Exchange model. Indeed, some uniqueness of the company is indicated but the fact that it is not significant in the Hong Kong Stock Exchange model implies that the Hong Kong Stock Exchange may have imposed a constraint over pricing of the shares with Wardley and the other two stock exchanges accepting it with the differences.

The same applies to Li & Fung Ltd. With a significant positive residual in both the Wardley and the Far East Exchange models, it is not significant in the Kam Ngan and the Hong Kong Stock Exchange models. In this case, both the Kam Ngan and the Hong Kong Stock Exchange may have imposed a pricing constraint on this issue. For the Safety Godown Limited, the pricing discloses large negative residuals in the Wardley model but not in the Far East and Kam Ngan Stock Exchange model. This indicates that the two stock exchanges again serve as a constraint on the pricing, using their individual pricing norm.

For Shipping General, the significant positive residual of this company in both of Wardley and the Hong Kong Stock Exchange model indicates the uniqueness of the company for deviation in the two models. Hutchison-Boag is significant in the Wardley model but not in the Hong Kong Stock Exchange model, showing once again the constraint imposed by the stock exchange.

However, Wardley seems to apply its own pricing process to Murjani Holdings Limited and also persuading Far East Exchange to admit the share even though there is a significant negative price residual when applying the Far East Exchange model.

For Jardine Fleming, as a joint-underwriter, Murjani Holdings reveals insignificant pricing residuals. This then indicates that Murjani Holdings is consistent in the two pricing models, Wardley and Jardine Fleming, even though it assumes a large negative residual with respect to the Far East Exchange model.

Wah Kwong Property, with a negative significant residual priced by the Jardine Fleming model, is not significant in the Far East, Kam Ngan and Hong Kong Stock Exchange models. It can be interpreted that the pricing models of the three stock exchanges prevail over the pricing model of Jardine Fleming to result in the deviation from the Jardine model. Another company with a significant positive residual, Hsin Chong Construction Company Limited, also signify the constraint of the Hong Kong Stock Exchange model over that of the Jardine Fleming model. The negative residual of the Hong Kong Worsted Mill Limited indicates the acceptance of the Jardine model by the Hong Kong Stock Exchange, resulting in significant residuals with the Hong Kong Stock Exchange but not with the Jardine model.

Similar to the Wardley experience, Li & Fung Holdings Ltd. also assumes a positive significant relationship in the Schroders & Chartered model. For the stock exchanges, Li & Fung is significant in the Far East model but not the Kam Ngan and Hong Kong Stock Exchanges model indicating the constraint of Kam Ngan and Hong Kong Stock Exchanges over that of Far East Exchange and Schroders & Chartered. Parallel to the Jardine handlings of Hong Kong Worsted Mills Ltd., the negative residual is significant with the Hong Kong Stock Exchange model but not significant in the Schroders & Chartered model, implying the acceptance of the pricing model of Schroders, even though it deviates from the Hong Kong Stock Exchange model.

In its joint-underwriting of Murjani Holdings Limited, Hang Seng Bank priced Murjani Holdings Limited in line with its pricing model although the pricing of this company resulted in a large negative residual with the Far East Exchange. In this case, it can be assumed that the Far East Exchange accepted the Hang Seng Bank pricing model.

For Oriental Financial Consultants Limited, two companies, New Era Land Securities Ltd. and Alexander Knitting Limited, respectively assumes a positive and negative residual. However, the residuals are not significant with the Kowloon Stock Exchange model. This then indicates that the two companies, although in line with the Kowloon Stock Exchange model, do not follow the pricing norm of Oriental Financial Consultants. On the other

hand, five companies, Lucky Man Co. Ltd., Yu Hing Holdings Ltd., Essential Enterprise Ltd., Chesterfield Co. Ltd. and Siu King Cheung Ltd. reveal significant residuals in the Kowloon pricing model but not the Oriental Financial Consultants pricing model. In such cases, it can be inferred that the Kowloon Stock Exchange has not imposed pricing constraint on these companies but has accepted these pricings according to the norm of Oriental Financial Consultants.

For Hang Lung Bank, the only company with a large negative residual is Ming Ren Investment Enterprise Ltd. The pricing of this company has a small residual according to the Kowloon Stock Exchange model but has a large residual in the Hang Lung Bank model. This also indicates the constraint imposed by the stock exchange on pricing even though it deviates from the pricing practice of its issuing houses.

For Overseas Trust Bank, the pricing of Union Bank reveals a large residual in both the issuing house model and the pricing model of the three listing stock exchanges. Apparently, this confirms the belief that commercial banks are priced differently from the pricing model developed by other industries. The resulting deviation is accepted by both the issuing houses and the stock exchanges. This is further confirmed by the pricing of Union Bank in the Bangkok Bank pricing model as well. For Bangkok Bank, Island Peninsula appears to have a large residual in the issuing house model as well as the stock exchanges, indicating concurrence of opinion from the institutions.

In summary, the observations on the excessive residuals can be grouped under the four quadrants. The number of observations without a significant residual is grouped under quadrants A, indicating a total of 171 obsrevations which abides pricing models of both issuing house and stock exchange. In quadrant B, 14 observations reveal large residuals in both pricing models of the issuing houses and the stock exchanges. Since this deviation is acceptable to both parties, it can be assumed that the uniqueness of pricing has been clearly understood. Quadrant C, with 17 observations, indicates a significant residual when applying the issuing house model. But when the 17 observations are applied to the stock exchange pricing model, the residuals are not excessively large. This means that for the 17 observations, the issuing houses have accepted the pricing model of the stock exchanges as a constraint to pricing, even though the observation deviates from their own pricing model. In quadrant D, there are 10 observations. This quadrant indicates the samples which result in smaller residuals when applying the issuing house model but the residuals become large when tested by the stock exchange model. In such cases, the stock exchanges appear to have accepted the issuing house pricing standard even though it differs from their own.

With some exceptions, it can well be said that out of the ~~295~~ 212 observations, there is consistency between the issuing house model and the stock exchange model in ~~254~~ 171 cases, or a consistency ratio of ~~86%~~ 80.6%. Of course, one must remember that issuing houses will choose the stock exchange whose pricing requirements best meet their

own pricing criteria. While this practice will help to maintain a high consistency ratio, for if not, the listings will simply be rejected, it can well be said that the majority of the listings comply with pricing models of both the issuing houses and the stock exchanges and that only rarely can exceptions be made.

Comparison with Results obtained from an Alternative Approach

In this study, pricing models for individual issuing houses were constructed with earlier new issues weighted by industrial classifications. Subsequent issues were used to cross-validate the model. Models developed by this approach will be termed "prediction" models. However, an alternative approach will be to construct models using all samples. The procedures and findings of this approach are given at the Appendix of this study. The models constructed with this approach are termed "explanatory" models. The merit of this approach is that the sample size used in the model construction will be increased. Because of the increase of sample size, theorectically, the model should give a better predictive power. However, the volatile market conditions in late 1972 and early 1973 might have induced some adjustments in the pricing decision, which may be very unusual. Nevertheless, these explanatory models will be compared with the prediction models in this section. Of the two models, the one with a higher explanatory power, as indicated by R^2 of the model, will be considered preferable for pricing purposes.

Wardley

The pricing models of Wardley developed under the two different approaches are shown in Table 8.8. Comparing the prediction and explanatory models, the three most significant variables common to both models are asset mix, total assets and dividend cover. The regression coefficients of these three variables are similar between the two models - that of asset mix being -0.05, total assets being 0.07 and dividend cover being -0.5. However, the

fourth significant variable differs between the two models, with the market interest rate variable in the prediction model and the market volatility variable in the explanatory model. When subsequent samples are included, the market volatility variable is included in the model. This is understandable as volatility indicates increased market expectation due to uncertainty. The market expectation tends to overshadow the rate of return. The inclusion of this variable reflects that when pricing new issues, this expectation factor of the prospective subscribers has been taken into account.

Both models meet the required F-statistic at 0.05 level of significance. In terms of explanatory power, the two models are extremely similar, with the prediction model at 0.55 and explanatory model at 0.56. Although the two models have similar explanatory power, the prediction model is preferred because unless we are confronted with a very volatile market, the market volatility variable may be less useful.

TABLE 8.8 Comparison of the Wardley Model under the Two Approaches

	α	log ASMIX		log TASS		log DCOV		log INT		VOLAT		F	R^2
		Coef.	S.L.	Coef.	S.L.	Coef.	S.L.	Coef.	S.L.	Coef.	S.L.	Test	
Prediction	0.79	-0.05	0.005	0.07	0.02	-0.51	0.05	-0.46	0.05			A	0.55
Explanatory	0.42	-0.05	0.005	0.07	0.001	-0.50	0.01			0.05	0.02	A	0.56

Coef. : Regression Coefficient

S.L. : Significance Level

α : Intercept Term

R^2 : Explanatory Power

A : Hypotheses accepted with a significance level of 0.05

Jardine Fleming

The pricing models of Jardine Fleming developed under the two different approaches are shown in Table 8.9. Comparing the prediction and explanatory models, the two models have the same significant variables, asset mix and total assets. The most significant variable, total assets, has the same coefficient of 0.15 in both models. Both are significant at the 0.001 level. The other significant variable, asset mix, has a coefficient of -0.08 in the prediction model and -0.06 in the explanatory model. The two differ in significance level, at 0.02 and 0.05 resepctively. Thus, the two variables were used by Jardine Fleming throughout the period of study.

Both models meet the critical F-Statistic at 0.05 level of significance. In terms of explanatory power, the prediction model achieves 0.74 while that of the explanatory model is 0.71. The slightly lower R^2 of the explanatory model indicates that slight adjustments are made in pricing new issues at the later period. Since the prediction model achieves a higher R^2, preference is given to this model for pricing purposes.

TABLE 8.9 Comparison of the Jardine Fleming Model under the Two Approaches

	α	log ASMIX		log TASS		F Test	R^2
		Coef.	S.L.	Coef.	S.L.		
Prediction	-0.22	-0.08	0.02	0.15	0.001	A	0.74
Explanatory	-0.18	-0.06	0.05	0.15	0.001	A	0.71

Schroders & Chartered

The pricing models of Schroders & Chartered developed under the two different approaches are shown in Table 8.10. Comparing the prediction and the explanatory models, two significant variables, total assets and market volatility, are common to both models. The regression coefficient of these two variables are similar between the two models. For total assets, it is 0.11 in the prediction model and 0.10 in the explanatory model, while that of market volatility is 0.13 for the prediction model and 0.11 for the explanatory model. For the prediction model a third variable, net asset per share, is present with a coefficient of 0.18. The absence of this variable in the explanatory model is understandable. Because of the very buoyant market conditions, net asset per share can be considered less important in pricing.

Both models meet the required F-Statistics at 0.05 level of significance. However, in terms of explanatory power, the two models are very different, with the prediction model at 0.79 and the explanatory model at 0.55. This significant decline in explanatory power can be explained by the possible omission of additional variables in pricing subsequent issues. As explained in the study when analysing residuals, special situations of pricing such issues have been identified. These special cases

represent unique situations and it is not possible to quantify these additional variables because such cases are not generalized Taking into considerations these special issues and the higher R^2, it appears more appropriate to use the prediction model for future price prediction.

TABLE 8.10 Comparison of the Schroders & Chartered Model under the Two Approaches

	α	log NASPS		log TASS		VLOAT		F Test	R^2
		Coef.	S.L.	Coef.	S.L.	Coef.	S.L.		
Prediction	-0.02	0.18	0.01	0.11	0.025	0.13	0.01	A	0.79
Explanatory	-0.133			0.10	0.02	0.11	0.05	A	0.55

Hang Seng Bank

The pricing models of Hang Seng Bank developed under the two different approaches are shown in Table 8.11. Comparing the prediction and explanatory models, two significant variables are common to both models. They are asset mix and total assets. The regression coefficients on total assets are 0.10 for both models, while that of asset mix is -0.08 for the prediction model and -0.06 for the explanatory model. In addition, two variables, dividend cover and market trend, are included in the explanatory model.

Both models meet the required F-Statistic at 0.05 level of significance. In terms of explanatory power, the prediction model achieves 0.69 while the explanatory model has an improved R^2 of 0.77. Although the difference of R^2 between the two models is marginal, the explanatory model is preferred for pricing purposes.

TABLE 8.11 Comparison of the Hang Seng Bank Model under the Two Approaches

	α	log ASMIX		log TASS		log DCOV		TREND		F Test	R^2
		Coef.	S.L.	Coef.	S.L.	Coef.	S.L.	Coef.	S.L.		
Prediction	0.18	-0.08	0.02	0.10	0.005					A	0.69
Explanatory	0.19	-0.06	0.02	0.10	0.001	-0.63	0.05	0.05	0.025	A	0.77

Oriental Financial Consultants

The pricing models of Oriental Financial Consultants developed under the two different approaches are shown in Table 8.12. Comparing the prediction and explanatory models, the significant variable common to both models is dividend cover. The regression coefficient of this variable is similar between the two models around -1.33, and significant at the 0.001 level. An additional variable in the prediction model is total assets, with a coefficient of 0.12 significant at the 0.05 level.

Both models meet the required F-Statistic at 0.05 level of significance. In terms of explanatory power, the prediction model achieves 0.81 while the explanatory model is 0.75. Since the prediction model has a higher R^2, it is preferred for pricing purposes.

TABLE 8.12 Comparison of the Oriental Financial Consultants Model under the Two Approaches

	α	log TASS		log DCOV		F Test	R^2
		Coef.	S.L.	Coef.	S.L.		
Prediction	0.30	0.12	0.05	-1.33	0.001	A	0.81
Explanatory	1.17			-1.35	0.001	A	0.75

Union Bank

The pricing models of Union Bank developed under the two different approaches are shown in Table 8.13. Comparing the prediction and explanatory models, the significant variable common to both models is dividend cover. The regression coefficient of the prediction model is -1.04 and that of the explanatory model is -0.93. Both coefficients are significant at the 0.001 level. The other significant variable present in the explanatory model is asset mix, with a coefficient of -0.01, significant at 0.05 level.

Both models meet the required F-Statistic at 0.05 level of significance. In terms of explanatory power, the two models are similar, with the prediction model at 0.94 and the explanatory model at 0.93. Since the prediction model has a higher explanatory power, it is preferred for pricing purposes.

TABLE 8.13 Comparison of the Union Bank Model under the Two Approaches

	α	log ASMIX		log DCOV		F Test	R^2
		Coef.	S.L.	Coef.	S.L.		
Prediction	1.09			-1.04	0.001	A	0.94
Explanatory	1.06	-0.01	0.05	-0.93	0.001	A	0.93

Hang Lung Bank

The pricing models of Hang Lung Bank developed under the two different approaches are shown in Table 8.14. Comparing the prediction and explanatory models, the only significant variable common to both models is dividend cover. The regression coefficient of this variable is -1.71 in the prediction model and -1.23 in the explanatory model. The two differ in significance level, at 0.005 and 0.02 respectively.

Both models meet the critical F-Statistic at 0.05 level of significance. In terms of explanatory power, the prediction model achieves 0.92 while the explanatory model is 0.50. The decline in R^2 of the explanatory model indicates that in pricing new issues at a later period, Hang Lung Bank made adjustments in pricing. As shown in the cross-validation of the prediction model, this accounts for qualified acceptance of the prediction model. In view of the unusual market conditions prevailing in the later period, these pricing adjustments are realistic. Taking into considerations of these issues and the then prevailing market conditions, it appears more appropriate to accept the prediction model for pricing purposes, unless such market conditions occur again.

TABLE 8.14 Comparison of the Hang Lung Bank Model under the Two Approaches

	α	log DCOV		F Test	R^2
		Coef.	S.L.		
Prediction	1.19	-1.71	0.005	A	0.92
Explanatory	1.11	-1.23	0.02	A	0.50

Overseas Trust Bank

The pricing models of Overseas Trust Bank developed under the two different approaches are shown in Table 8.15. Comparing the prediction and the explanatory models, one significant variable, dividend cover, is common to both models. The regression coefficient of this variable is -1.02 in the prediction model and -1.06 in the explanatory model.

Both models meet the required F-Statistic at 0.05 level of significance. In terms of explanatory power, the two models are different, with the prediction model at 0.67 and the explanatory model at 0.50. This significant decline in explanatory power can be explained by the possible omission of additional variables in pricing subsequent issues. Since the market was buoyant towards the later period of study, it is understandable that some adjustments may be made to pricing by some underwriters. Taking into consideration of such market condition, it appears more appropriate to use the prediction model for pricing purposes, unless we are confronted with a very volatile market again.

TABLE 8.15 Comparison of the Overseas Trust Bank Model under the Two Approaches

	α	log DCOV		F Test	R^2
		Coef.	S.L.		
Prediction	1.09	-1.02	0.025	A	0.67
Explanatory	1.08	-1.06	0.001	A	0.50

Bangkok Bank

The pricing models of Bangkok Bank developed under the two different approaches are shown Table 8.16. Comparing the prediction and the explanatory models, the only significant variable, dividend cover, is common to both models. The regression coefficient of this variable is very similar between the two models, both about -1.67, significant at 0.025 level. In fact, the two models can be considered identical since both intercept terms are 1.23.

Both models meet the required F-Statistic at 0.05 level of significance. In terms of explanatory power, the two models are the same, both at 0.50. Since the two models are so similar, both in terms of parameters of the model and explanatory power, there appears no need to differentiate between the two models.

TABLE 8.16 Comparison of the Bangkok Bank Model under the Two Approaches

	α	log DCOV		F Test	R^2
		Coef.	S.L.		
Prediction	1.23	-1.67	0.025	A	0.50
Explanatory	1.23	-1.68	0.025	A	0.50

Far East Exchange

The pricing models of Far East Exchange developed under the two different approaches are shown in Table 8.17. Comparing the prediction and the explanatory models, the two models have two significant variables in common, total assets and dividend cover, is significant at the 0.001 level in both models. This variable in the prediction model has a regression coefficient of -1.29 and in the explanatory model -1.27. The next significant variable is total asset, with a coefficient of 0.05 in the prediction model and 0.06 in the explanatory model, at significance levels of 0.005 and 0.001 respectively. In addition, the market interest rate variable is significant in the prediction model with a coefficient of -0.51 significant at 0.05 level. Because of increased market expectation, it appears that there was perhaps less need to consider the rate of returns.

Both models meet the critical F-Statistic at 0.05 level of significance. In terms of explanatory power, the prediction model achieves 0.53 while the explanatory model is 0.52. The higher R^2 of the prediction model indicates that it is preferred for pricing purposes.

TABLE 8.17 Comparison of the Far East Exchange Model under the Two Approaches

	α	log TASS		log DCOV		log INT		F Test	R^2
		Coef.	S.L.	Coef.	S.L.	Coef.	S.L.		
Prediction	1.11	0.05	0.005	-1.29	0.001	-0.51	0.05	A	0.53
Explanatory	0.69	0.06	0.001	-1.27	0.001			A	0.52

Kam Ngan Stock Exchange

The pricing models of Kam Ngan Stock Exchange developed under the two different approaches are shown in Table 8.17. Comparing the prediction and explanatory models, the two models have two variables in common. The most significant variable is dividend cover, significant in both models at 0.001 level, with a coefficient of -1.29 for prediction model and -1.23 for the explanatory model. The other significant variable, total assets, has a coefficient of 0.06 in the prediction model, and 0.04 in the explanatory model. The two differ in significance level, at 0.001 and 0.01 respectively. In addition, a third variable, net asset per share, is present in the explanatory model, with a regression coefficient of 0.10, at 0.01 level of significance.

Both models meet the critical F-Statistic at 0.05 level of significance. In terms of explanatory power, the prediction model achieves a R^2 of 0.48, while the explanatory model is 0.54. Since the difference in explanatory power can be considered marginal, the explanatory model has a better explanatory power. Hence, for prediction purposes, explanatory model can be considered more preferable than the prediction model.

TABLE 8.18 Comparison of the Kam Ngan Stock Exchange Model under the Two Approaches

	α	log NASPS		log TASS		log DCOV		F Test	R^2
		Coef.	S.L.	Coef.	S.L.	Coef.	S.L.		
Prediction	0.72			0.06	0.001	-1.29	0.001	A	0.48
Explanatory	0.81	0.10	0.01	0.04	0.01	-1.23	0.001	A	0.54

Hong Kong Stock Exchange

The pricing models of Hong Kong Stock Exchange developed under the two different approaches are shown in Table 8.18. Comparing the prediction and explanatory models, the two models have two significant variables in common, asset mix and total assets. The coefficient of total assets in the prediction model is 0.13 and in the explanatory model, it is 0.11. This variable is significant variable at the 0.001 level in both models. The other significant variable in common is asset mix, both significant at the 0.02 level. The coefficient in the prediction model is -0.05 and in the explanatory model is -0.04. A third variable present only in the explanatory model, is market interest rate, with a regression coefficient of -0.33, significant at the 0.05 level.

Both models meet the critical F-Statistic at 0.05 level of significance. The explanatory power of both models is 0.52. As the R^2 of the two models are the same, both models can be considered adequate for pricing purposes.

TABLE 8.19 Comparison of the Hong Kong Stock Exchange Model under the Two Approaches

	α	log ASMIX		log TASS		log INT		F Test	R^2
		Coef.	S.L.	Coef.	S.L.	Coef.	S.L.		
Prediction	0.005	-0.05	0.02	0.13	0.001			A	0.52
Explanatory	0.39	-0.04	0.02	0.11	0.001	-0.33	0.05	A	0.52

Kowloon Stock Exchange

The pricing models of Kowloon Stock Exchange developed under the two different approaches are shown in Table 8.20. Comparing the prediction and explanatory models, the two models have the same significant variables, asset mix and dividend cover. The more significant variable is dividend cover, with a regression coefficient of -0.4 in the prediction model and -0.51 in the explanatory model, significant at 0.01 and 0.001 respectively. The other significant variable is asset mix, with a regression coefficient of -0.06 in the prediction model and -0.04 in the explanatory model, at significant levels of 0.02 and 0.025 respectively.

Both models meet the critical F-Statistic at 0.05 level of significance. The explanatory power of the prediction model is 0.53 while that of the explanatory model is 0.48. The slightly lower R^2 of the explanatory model indicates that some adjustments were made for the subsequent issues. Although the additional variable used was not detected in the model, the marginal difference between the explanatory power of the two models will enable both models to be considered adequate for pricing purposes.

TABLE 8.20 Comparison of the Kowloon Stock Exchange Model under the Two Approaches

	α	log ASMIX		log DCOV		F Test	R^2
		Coef.	S.L.	Coef.	S.L.		
Prediction	1.00	-0.06	0.02	-0.4	0.01	A	0.53
Explanatory	1.03	-0.04	0.025	-0.51	0.001	A	0.48

Concluding Remarks

In conclusion, we shall evaluate the pricing models of the leading issuing houses and stock exchanges in the light of findings of this study. The major criteria of evaluation are the consistency and compatibility of each model. In particular, attention is focused on the practical application of the pricing model to prospective issuing companies or underwriters.

The construction of the pricing model for major issuing houses and their subsequent validation indicate that the process of pricing a new issue is consistent with a particular emphasis on certain variables according to the size of the major issuing houses. It appears that the major issuing houses emphasize valuation of asset of the firm whereas the smaller issuing houses concentrate on dividend policies. Also, this finding has to be viewed against a background of varying market conditions. Market volatility has not affected the consistency of the models significantly. Considerations given to the various variables are also quite identical between large and small issuing houses. This consistency revealed in the model indicates that the pricing process is rational thinking based on fundamental aspects of the company. Judging from the issue price and the subsequent market price, some people may doubt the sophistication of the issuing house and attribute the wide differences in the market discounts to the defects of the pricing process. Admittedly, pricing below subsequent market price may mean a loss in the value of proceeds to the issuing company. However, in the

interest of investors, a more fundamental view in the long-term is essential, particularly for the less sophisticated. Furthermore, it must be realized that the issuing houses have to commit themselves financially in underwriting the issue. In other words, the issuing house must price the issue at a level which itself will invest in. Even when the market is irrational, the issuing house has to invest rationally.

The pricing model of the stock exchanges indicates the different factors which the different stock exchanges consider when admitting a new listing. Again, it reveals different but consistent processes of pricing. The comparatively lower explanatory power of the stock exchanges pricing models demonstrates that the stock exchanges were more accommodating towards the heterogeneous listings put forward by the various issuing houses. Although there are accusations that the stock exchanges pose constraints on new issue pricing, the findings of the study do not substantiate these. On the other hand, one must bear in mind the responsibility of stock exchanges towards general investors. In such erratic market conditions, it is necessary to use pricing as an indication to the public of a reasonable price level and this level is arrived at by considering fundamentally the intrinsic value of the firm rather than by mass psychology in the market.

When comparing the two approaches of constructing the prediction and the explanatory model, one must take into account of the very buoyant period of this study. The decline of R^2 for the majority of the explanatory models indicated that some adjustments to the pricing patterns were made. Although basic pricing patterns were not affected, such adjustments were made by the inclusion of new variables possibly because of the unusual market conditions. However, one must bear in mind that the market conditions in late 1972 and early 1973 were very unusual indeed. In our comparative analysis of the two approaches, it appears that in nine out of the thirteen institutions under study, the prediction model was preferred, as shown in the summary of findings in Table 8.21. The explanatory model gave a better explanatory power in only two cases, Hang Seng Bank and Kam Ngan Stock Exchange. In the remaining two cases, Bangkok Bank and Hong Kong Stock Exchange, the two approaches offered similar results. Since such unusual market conditions are less likely to occur again, the prediction approach is preferred for pricing in normal market conditions.

TABLE 8.21 Summary of Findings of Comparison between the Two Approaches

Pricing Decision-Makers	Prediction Model Preferred	Both Models are Adequate	Explan-atory Model Preferred
Wardley	X		
Jardine Fleming	X		
Schroders & Chartered	X		
Hang Seng			X
Oriental	X		
Union Bank	X		
Hang Lung Bank	X		
Overseas Trust Bank	X		
Bangkok Bank		X	
Far East	X		
Kam Ngan			X
Hong Kong		X	
Kowloon	X		
T O T A L	9	2	2

To a prospective issuing company, the model can be used to predict pricing decisions by issuing houses and stock exchanges. Hopefully, this will facilitate flotation decisions by a broad indication to existing shareholders of an expected price level for their shares. The stock exchange models can help to serve the company again by a broad indication whether a price level is acceptable to a stock exchange. Thus, these models can be used as management tools to facilitate financing decisions of the firm. Nonetheless, it must be stressed that the pricing models should be used intelligently as individual cases differ.

Finally, it must be stressed that the construction of pricing models represents an attempt to explain the existing pricing practices of issuing houses and stock exchanges which can be attributed to their "sophistication". Undoubtedly, one can accept that issuing houses should minimize the market discount. This is perhaps more applicable in developed markets such as London or New York, where less irrational investors are present. Nonetheless, the pricing models which have been used by issuing houses and stock exchanges between 1970 - 1974 warrant attention with their emphasis on the fundamental approach.

APPENDIX :

AN ALTERNATIVE APPROACH

The pricing models in this study were constructed using only earlier new issues with industrial weightings. Subsequent samples were used as hold-out data to cross-validate the predictive power of the models. As pointed out in the study, an alternative approach of constructing a pricing model will be to include all available pricing observations by an underwriter in the regression analysis. This has the merit of increasing the sample size in the model constructed but has the demerit of not being able to cross-validate the model. Nevertheless, it is expedient to construct pricing models with all available data. Such models will help to explain new issue pricings during this period. These explanatory models can then be compared with the price prediction models constructed using earlier issues weighted by industries. In essence, the earlier phases of the methodology are the same for both methods, differing only in Phase IV.

Statistical analysis will be done by step-wise regression to identify multicollinearities between ~~the dependent and~~ the independent variables using the ICL Statistical Analysis Mark 2 1900 Series : Subprogramme Multiple Regression Analysis. The dependent variable will be the price-earnings ratio as forecasted for the first year after listing.

The same independent variables as identified by interviews with decision-makers are used in the regression analysis. Thus, the model takes the form of :-

$$\log P/E_i = \alpha + \beta_1 \hat{x}_{1\,1}^{\log} + \beta_2 \hat{x}_{2\,2}^{\log} + \beta_3 \hat{x}_{3\,3}^{\log} + \beta_4 \hat{x}_{4\,4}^{\log} + \beta_5 \hat{x}_{5\,5}^{\log} + \beta_6 U + \beta_7 V + \epsilon$$

where $\beta_1, \beta_2 \ldots\ldots\ldots\ldots \beta_7$ are regression coefficients,

and P/E is the price-earning ratio.

x_1 Mix of assets (ASMIX)

x_2 Net asset per share (NASPS)

x_3 Size of company (TASS)

x_4 Dividend cover (DCOV)

x_5 The market interest rate (INT)

U The volatility variable into high volatile and low volatility state, dummy (VOLAT)

V The short-term market trend variable as determined by trend analysis, dummy (TREND)

ϵ The error term.

For each coefficient, β, there will be a corresponding level of statistical significance. The 5% level will again be used to be defined as the level of significance.

For each underwriter, both the prediction model and the explanatory model will be compared and analyzed in terms of significant regression coefficients and explanatory powers (R^2).

Wardley

From Table A-1, the explanatory model for Wardley based on the 63 samples takes the form of:-

$$\log P/E_i = 0.42250 - 0.04764 \log \text{ASMIX} + 0.07441 \log \text{TASS} - 0.49597 \log \text{DCOV} + 0.04796 \text{ VOLAT}$$

where ASMIX is given by the ratio of current asset to net tangible asset of the company,

TASS , the size of the company given by the total assets of the firm,

DCOV , the forecasted dividend cover multiple,

and VOLAT, the market volatility.

The model constructed with the four variables achieves a multiple correlation of 0.748 or a R^2 of 0.559. The F-Statistic, with 4 and 57 degrees of freedom, is 18.0974. This exceeds 2.6060, the critical value of F-Statistic with 4 and 40 degrees of freedom at 0.05 level of significance.

TABLE A-1 Explanatory Model for Wardley

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.04765	3.48	0.005
Total Assets (log)	0.07441	3.71	0.001
Dividend Cover (log)	-0.49597	2.81	0.01
Market Volatility	0.04796	2.70	0.02

Residual Error	0.05957
Multiple Correlation (R)	0.748
R^2	0.559
Intercept Term (α)	0.42250
Degrees of Freedom	57
Critical Value of T-Statistic with 60 d.f. at 0.05 level of significance	2.0003
F-Statistic with 4 $d.f._1$ and 57 $d.f._2$	18.0974
Critical Value of F-Statistic with 4 $d.f._1$ and 40 $d.f._2$ at 0.05 level of significance	2.6060

Variables not in the Regression Set	T-Statistic
Net Asset per Share (log)	1.10
Market Interest Rate (log)	0.20
Market Trend	0.43

Of the four significant variables in the model, the most significant variable is total assets, with a coefficient of 0.07441, significant at the 0.001 level. The positive coefficient shows a direct relationship with the price-earnings ratio. The next significant variable is asset mix, with 0.005 level of significance. The variable has a regression coefficient of -0.04764. Two other significant variables are dividend and market volatility significant at the 0.01 and 0.02 levels respectively. Three other explanatory variables, net asset per share, market interest rate and the market trend are not significant at the 0.05 level.

Jardine Fleming

As shown in Table A-2, the explanatory model for Jardine Fleming using all the 29 samples takes the form of:-

$$\log P/E_i = -0.17595 - 0.05873 \log \text{ASMIX} + 0.14524 \log \text{TASS}$$

where ASMIX is given by the ratio of current asset to net tangible asset of the company,

and TASS , the size of the company given by the total assets of the firm.

The model constructed with the two variables achieves a multiple correlation of 0.841 or a R^2 of 0.707. The F-Statistic with 2 and 26 degrees of freedom is 31.3286. This is significant when compared with the critical value, 3,3690, with 2 and 26 degrees of freedom at 0.05 level of significance.

Of the two significant variables in the model, the most significant variable is total assets with a coefficient of 0.14524, significant at the 0.001 level. The positive coefficient shows a direct relationship with the price of issue. The other significant variable is asset mix. It has a regression coefficient of -0.05873, whose T-Statistic is significant at the 0.05 level.

TABLE A-2 Explanatory Model for Jardine Fleming

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.05873	2.15	0.05
Total Assets (log)	0.14524	5.31	0.001

Residual Error	0.05873
Multiple Correlation (R)	0.841
R^2	0.707
Intercept Term (α)	-0.17595
Degrees of Freedom	26
Critical Value of T-Statistic with 26 d.f. at 0.05 level of significance	2.0555
F-Statistic with 2 $d.f._1$ and 26 $d.f._2$	31.3286
Critical Value of F-Statistic with 2 $d.f._1$ and 26 $d.f._2$ at 0.05 level of significance	3.3690

Variables not in the Regression Set	T-Statistic
Net Asset per Share (log)	0.68
Dividend Cover (log)	1.64
Market Interest Rate (log)	1.10
Market Volatility	0.80
Market Trend	0.29

Schroders & Chartered

From Table A-3, the explanatory model for Schroders & Chartered using 22 observations takes the form of:-

$$\log \; P/E_i = 0.13325 + 0.09820 \; \log \; TASS + 0.11240 \; VOLAT$$

where TASS is the size of the company given by the total assets of the firm,

and VOLAT, the market volatility.

The model constructed with the two variables achieves a multiple correlation of 0.742 or a R^2 of 0.550. The F-Statistic, with 2 and 19 degrees of freedom is 11.6641. This exceeds 3.5219, the critical value of F-Statistic with 2 and 19 degrees of freedom at 0.05 level of significance.

Of the two significant variables in the model, the most significant variable is total assets, with a regression coefficient of 0.09820, significant at the 0.02 level. The positive sign of the coefficient indicates that the variable has a direct relationship with the price-earnings ratio. Another significant variable is market volatility, with a coefficient of 0.11240, significant at the 0.05 level.

TABLE A-3 Explanatory Model for Schroders & Chartered

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Total Assets (log)	0.09820	2.62	0.02
Market Volatility	0.11240	2.42	0.05

Residual Error	0.06654
Multiple Correlation (R)	0.742
R^2	0.550
Intercept Term (α)	0.13325
Degrees of Freedom	19
Critical Value of T-Statistic with 19 d.f. at 0.05 level of significance	2.0930
F-Statistic with 2 $d.f._1$ and 19 $d.f._2$	11.6641
Critical Value of F-Statistic with 2 $d.f._1$ and 19 $d.f._2$ at 0.05 level of significance	3.5219

Variables not in the Regression Set	T-Statistic
Asset Mix (log)	1.37
Net Asset per Share (log)	1.66
Dividend Cover (log)	0.42
Market Interest Rate (log)	0.67
Market Trend	0.03

Hang Seng Bank

Results of the explanatory model for Hang Seng Bank are shown in Table A-4. Using all 24 observations, the model takes the form of:-

$$\log P/E_i = 0.18534 - 0.05597 \log \text{'ASMIX} + 0.10323 \log \text{TASS} - 0.62759 \log \text{'DCOV} + 0.05318 \text{ CTREND}$$

where 'ASMIX is given by the ratio of current asset to net tangible asset of the company,

'TASS, the size of the company given by the total asset of the firm,

'DCOV, the forecasted dividend cover multiple,

and 'TREND, the market trend.

The model constructed with the four variables achieves a multiple correlation of 0.88 or a R^2 of 0.774. The F-Statistic with 4 and 19 degrees of freedom is 16.3676. This exceeds 2.8951, the critical value of F-Statistic with 4 and 19 degrees of freedom, at 0.05 level of significance.

Of the four significant variables in the model, the most significant variable is total assets with a regression coefficient of 0.10323, significant at the 0.001 level. The next significant variable is asset mix, with a coefficient of -0.05597, significant at 0.02 level. The third significant variable is market trend, with a regression coefficient of 0.05318, at 0.025 level of significance. The fourth variable which is significant at 0.05 is dividend cover or the dividend policy of the issuing company.

TABLE A-4 Explanatory Model for Hang Seng Bank

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.05597	2.57	0.02
Total Assets (log)	0.10323	5.26	0.001
Dividend Cover (log)	-0.62759	2.29	0.05
Market Trend	0.05318	2.48	0.025

Residual Error	0.03786
Multiple Correlation (R)	0.88
R^2	0.774
Intercept Term (α)	0.18534
Degrees of Freedom	19
Critical Value of T-Statistic with 19 d.f. at 0.05 level of significance	2.0930
F-Statistic with 4 $d.f._1$ and 19 $d.f._2$	16.3676
Critical Value of F-Statistic with 4 $d.f._1$ and 19 $d.f._2$ at 0.05 level of significance	2.8951

Variables not in the Regression Set	T-Statistic
Net Asset per Share (log)	0.89
Market Interest Rate (log)	0.91
Market Volatility	0.86

Oriental Financial Consultants

From Table A-5, the explanatory model for Oriental Financial Consultants, based on all 22 samples, takes the form of:-

$$\log P/E_i = 1.17165 - 1.35173 \log DCOV$$

where DCOV is the forecasted dividend cover multiple.

With only one significant variable, the model achieves a multiple correlation of 0.868 or a R^2 of 0.753. The F-Statistic, with 1 and 20 degrees of freedom is 60.8757. When compared with 4.3513, the critical value of F-Statistic with 1 and 20 degrees of freedom at 0.05 level of significance, this F-Statistic is significant. The only significant variable, dividend cover, has a regression coefficient of -1.35173, at a significance level of better than 0.001. It is worth noting that all issues by Oriental Financial Consultants were made when market conditions were volatile and on the up-trend, and when the market interest rate was at 4.875%.

TABLE A-5 Explanatory Model for
Oriental Financial Consultants

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover (log)	-1.35173	7.80	0.001

Residual Error	0.06226
Multiple Correlation (R)	0.868
Intercept Term (α)	0.753
Degrees of Freedom	20
Critical Value of T-Statistic with 20 d.f. at 0.05 level of significance	2.0860
F-Statistic with 1 $d.f._1$ and 20 $d.f._2$	60.8757
Critical Value of F-Statistic with 1 $d.f._1$ and 20 $d.f._2$ at 0.05 level of significance	4.3513

Variables not in the Regression Set	T-Statistic
Net Asset per Share (log)	0.27
Total Assets (log)	1.63

Union Bank

Of the 17 new issues underwritten by Union Bank, there is one issue each for the commercial, hotel and the shipping and dock categories. It is felt that samples in these three categories were too limited and should be eliminated from the construction of the explanatory model. Hence, a model was constructed with land companies only. As shown in Table A-6, the explanatory model for Union Bank takes the form of:-

$$\log P/E_i = 1.06437 - 0.01376 \log ASMIX - 0.92698 \log DCOV$$

where ASMIX, or Asset Mix, is the ratio of current assets to net tangible assets of the new listings,

and DCOV, the forecasted dividend cover multiple.

With two significant variables, the model achieves a multiple correlation of 0.966 or a R^2 of 0.93. The F-Statistic, with 2 and 10 degrees of freedom, is 70.5154. This exceeds 4.9646, the critical value of F-Statistic with 2 and 10 degrees of freedom at 0.05 level of significance.

Of the two significant variables in the model, the more significant is dividend cover, with a coefficient of -0.92698, significant at the 0.001 level. The next significant variable is asset mix, with a regression coefficient of -0.01376, significant at the 0.05 level. All issues underwritten by Union Bank were made when interest rate was stable and in volatile market conditions. The total assets variable is significant at the 0.1 level while other variables are not significant.

TABLE A-6 Explanatory Model for Union Bank

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.01376	2.29	0.05
Dividend Cover (log)	-0.92698	10.95	0.001

Residual Error 0.01477

Multiple Correlation (R) 0.966

R^2 ..... 0.933

Intercept Term (α) 1.06437

Degrees of Freedom 10

Critical Value of T-Statistic with 10 d.f.
at 0.05 level of significance 2.2281

F-Statistic with 2 $d.f._1$ and 10 $d.f._2$..... 70.5154

Critical Value of F-Statistic with 2 $d.f._1$ and
10 $d.f._2$ at 0.05 level of significance 4.9646

Variable not in the Regression Set	T-Statistic
Total Assets (log)	2.21

Hang Lung Bank

As shown in Table A-7, the explanatory model for Hang Lung Bank based on 11 samples takes the form of:-

$$\log P/E_i = 1.11730 - 1.23497 \log DCOV$$

where DCOV is the forecasted dividend cover multiple.

The model constructed with only one significant variable achieves a multiple correlation of 0.706 or a R^2 of 0.498. The F-Statistic with 1 and 9 degrees of freedom is 8.9495. This exceeds 5.1174, the critical value of F-Statistic with 1 and 9 degrees of freedom at 0.05 level of significance.

The only significant variable in the model, dividend cover, has a regression coefficient of -1.23497, significant at the 0.02 level. All issues, except one, are made when market conditions were volatile and on the up-trend. Similarly, with the exception of one, issues were made when interest rate was stable at 4.875%.

TABLE A-7 Explanatory Model for Hang Lung Bank

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover (log)	-1.23497	2.99	0.02

Residual Error	0.06507
Multiple Correlation (R)	0.706
R^2	0.498
Intercept Term (α)	1.11730
Degrees of Freedom	9
Critical Value of T-Statistic with 9 d.f. at 0.05 level of significance	2.2622
F-Statistic with 1 $d.f._1$ and 9 $d.f._2$	8.9495
Critical Value of F-Statistic with 1 $d.f._1$ and 9 $d.f._2$ at 0.05 level of significance	5.1174

Variable not in the Regression Set	T-Statistic
Market Trend	0.37

Overseas Trust Bank

Using all the 12 samples to construct the model for Overseas Trust Bank proves unsuccessful. It achieves a low multiple correlation of 0.264, or an explanatory power (R^2) of 0.069. With 1 and 10 degrees of freedom, the model only attains a F-Statistic of 0.0833, which is far below the critical value of 4.9646, at 0.05 level of significance. The more significant variable is net asset per share, with a T-Statistic of 0.86, significant only at the 0.5 level. Hence, the model was rejected. As the overseas Trust Bank underwrote 9 land companies, 1 commercial and 2 financial companies, it is felt that samples in the commercial and financial categories were too limited. Hence, a model was constructed with land companies only.

From Table A-8, a model for Overseas Trust Bank was constructed with the 9 land issues. The model takes the form of:-

$$\log P/E_i = 1.08103 - 1.06401 \log DCOV$$

where DCOV is the forecasted dividend cover multiple.

This model achieves a multiple correlation of 0.915 or a R^2 of 0.837. The F-Statistic, with 1 and 7 degrees of freedom is 36.232. This exceeds the critical value of 5.5914 with 1 and 7 degrees of freedom at 0.05 level of significance. This only significant variable has a coefficient of -1.06401, significant at the 0.001 level. It must be stressed that this model should only be applied towards price prediction of land companies by Overseas Trust Bank in the future. It appears that other industrial classifications did not follow this model.

TABLE A-8 Explanatory Model for Overseas Trust Bank (Land Only)

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover (log)	-1.06401	6.02	0.001

Residual Error	0.02295
Multiple Correlation (R)	0.915
R^2	0.837
Intercept Term (α)	1.08103
Degrees of Freedom	7
Critical Value of T-Statistic with 7 d.f. at 0.05 level of significance	2.3646
F-Statistic with 1 $d.f._1$ and 7 $d.f._2$	36.2320
Critical Value of F-Statistic with 1 $d.f._1$ and 7 $d.f._2$ at 0.05 level of significance	5.5914

Variable not in the Regression Set	T-Statistic
Net Asset per Share (log)	0.06

Bangkok Bank

When the 13 samples of Bangkok Bank were used to construct an explanatory model, the results were not satisfactory. The model constructed achieves a multiple correlation of only 0.432 or an explanatory power of 0.186. With 1 and 11 degrees of freedom, the model has a F-Statistic of 2.5259. When compares with 4.8443, the critical value of F-Statistic with 1 and 11 degrees of freedom at 0.05 level of significance, the model is considered not acceptable. The only significant variable in this model is dividend cover with a T-Statistic of 1.59, being significant only at 0.25 level of significance.

Considering that the sample includes observations of 10 land companies, one commercial and two financial companies, it is felt that construction of a model using land companies only may be more meaningful. Hence, such a model is constructed as shown in Table A-9. The model takes the form of:-

$$\log P/E_i = 1.23044 - 1.68092 \log DCOV$$

where DCOV is the forecasted dividend cover multiple.

The model constructed achieves a multiple correlation of 0.707 or an explanatory power of 0.4999. The F-Statistic, with 1 and 8 degrees of freedom, is 8.0049. This exceeds 5.3177, the critical value of F-Statistic with 1 and 8 degrees of freedom at 0.05 level of significance. The only significant variable in the model, dividend cover, has a regression coefficient of -1.68092, significant at the 0.02% level. Although not in the regression set, it is worth mentioning that total asset, with a T-Statistic of 1.54, is significant at the 0.2 level. Other variables are not significant.

TABLE A-9 Explanatory Model for Bangkok Bank (Land Only)

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Dividend Cover (log)	-1.68092	2.83	0.025

Residual Error	0.09390
Multiple Correlation (R)	0.707
R^2	0.499
Intercept Term (α)	1.23044
Degrees of Freedom	8
Critical Value of T-Statistic with 8 d.f. at 0.05 level of significance	2.3060
F-Statistic with 1 $d.f._1$ and 8 $d.f._2$	8.0049
Critical Value of F-Statistic with 1 $d.f._1$ and 8 $d.f._2$ at 0.05 level of significance	5.3177

Variables not in the Regression Set	T-Statistic
Asset Mix (log)	0.47
Net Asset per Share (log)	0.07
Total Assets (log)	1.54

Far East Exchange

From Table A-10, the explanatory model for Far East Exchange, using 110 samples, takes the form of:-

$$\log P/E_i = 0.68910 + 0.05865 \log TASS - 1.26503 \log DCOV$$

where TASS is the size of the company given by the total assets of the firm,

and DCOV, the forecasted dividend cover multiple.

The model constructed with the two variables achieves a multiple correlation of 0.724 or a R^2 of 0.524. The F-Statistic, with 2 and 107 degrees of freedom, is 59.0094. This exceeds 3.1504, the critical value of F-Statistic with 2 and 60 degrees of freedom at 0.05 level of significance.

Although both significant variables in the model are significant at the 0.001 level, dividend cover is more significant with a T-Statistic of 9.94 compared with that of total assets at 4.52. Dividend cover has a regression coefficient of -1.26503 while that of total assets is 0.05865. Two other variables, although not significant at the 0.05 level, are significant at the 0.10 level. These two variables are market interest rate and market volatility.

TABLE A-10 Explanatory Model for Far East Exchange

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Total Assets (log)	0.05865	4.52	0.001
Dividend Cover (log)	-1.26503	9.94	0.001

Residual Error	0.06098
Multiple Correlation (R)	0.724
R^2	0.524
Intercept Term (α)	0.68910
Degrees of Freedom	107
Critical Value of T-Statistic with 60 d.f. at 0.05 level of significance	2.0003
F-Statistic with 2 $d.f._1$ and 107 $d.f._2$	59.0094
Critical Value of F-Statistic with 2 $d.f._1$ and 60 $d.f._2$ at 0.05 level of significance	3.1504

Variables not in the Regression Set	T-Statistic
Asset Mix (log)	0.35
Net Asset per Share (log)	0.05
Market Interest Rate (log)	1.70
Market Volatility	1.78
Market Trend	0.04

Kam Ngan Stock Exchange

Table A-11 shows the findings of the explanatory model for Kam Ngan Stock Exchange. Using 100 samples, the model takes the form of:-

$$\log P/E_i = 0.80561 + 0.10474 \log NASPS + 0.04254 \log TASS - 1.22507 \log DCOV$$

where NASPS is the net asset per share,

TASS, the size of the company given by the total assets of the firm,

and DCOV, the forecasted dividend cover multiple.

The model constructed with the three variables achieves a multiple correlation of 0.734 or a R^2 of 0.538. The F-Statistic, with 3 and 96 degrees of freedom, is 37.2821. This exceeds 2.7581, the critical value of F-Statistic with 3 and 60 degrees of freedom at 0.05 level of significance.

Of the three significant variables in the model, the most significant is dividend cover, with a regression coefficient of -1.22507, significant at the 0.001 level. The other two significant variables are net asset per share, with a regression coefficient of 0.10474, and total assets with 0.04254. Both variables meet the significance level of 0.01. It is worth noting that all issues listed on the Kam Ngan Stock Exchange were made when the market conditions were volatile.

TABLE A-11 Explanatory Model for Kam Ngan Stock Exchange

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Net Asset per Share (log)	0.10474	2.67	0.01
Total Assets (log)	0.04254	2.86	0.01
Dividend Cover (log)	-1.22507	8.55	0.001

Residual Error	0.05775
Multiple Correlation (R)	0.734
R^2	0.538
Intercept Term (α)	0.80561
Degrees of Freedom	96
Critical Value of T-Statistic with 60 d.f. at 0.05 level of significance	2.0003
F-Statistic with 3 $d.f._1$ and 96 $d.f._2$	37.2821
Critical Value of F-Statistic with 3 $d.f._1$ and 60 $d.f._2$ at 0.05 level of significance	2.7581

Variables not in the Regression Set	T-Statistic
Asset Mix (log)	0.36
Market Interest Rate (log)	0.06
Market Trend	0.36

Hong Kong Stock Exchange

From Table A-12, the explanatory model for Hong Kong Stock Exchange constructed with 53 samples takes the form of:-

$$\log P/E_i = 0.39405 - 0.04288 \log ASMIX + 0.10763 \log TASS - 0.32863 \log INT$$

where ASMIX is given by the ratio of current asset to net tangible asset of the company,

TASS, the size of the company given by the total assets of the firm,

and INT, the one year bank fixed deposit rate at the time of issue.

The model, constructed with the three variables, achieves a correlation of 0.718 or a R^2 of 0.515. The F-Statistic, with 3 and 49 degrees of freedom, is 17.4118. This exceeds 2.7581, the critical value of F-Statistic with 3 and 60 degrees of freedom at 0.05 level of significance. Of the four significant variables in the model, the most significant variable is total assets, with a coefficient of 0.10763, significant at the 0.01 level. The next significant variable is asset mix, with 0.02 level of significance, and a regression coefficient of -0.04288. The third significant variable is market interest rate, with a coefficient of -0.32863 significant at the 0.05 level.

Company Balance Sheet

FIXED ASSETS		
Land and Building, at cost		$ 9,000,000
CURRENT ASSETS		
Land at cost	$ 1,465,000	
Building work in progress	2,094,169	
Deposit for purchase of shares of Charade Investment Co. Ltd. (Owner of N.K.I.L.5412)	$ 1,000,000	
Cash in hand and at bank	926,138	
Time deposits	69,150	$ 5,554,457
		$14,554,457
Less: CURRENT LIABILITIES		
Account Payable	$ 2,174	
Bank Loan (Secured)	700,000	
Customers' deposits	2,604,006	3,306,180
N E T T A N G I B L E A S S E T S		$11,248,277

Kowloon Stock Exchange

From Table A-13, the explanatory model for Kowloon Stock Exchange using 32 samples, takes the form of:-

$$\log P/E_i = 1.02908 - 0.04439 \log ASMIX - 0.51164 \log DCOV$$

where ASMIX is given by the ratio of current asset to net tangible asset of the company,

and DCOV, the forecasted dividend cover multiple.

The model constructed with the two variables achieves a multiple correlation of 0.693 or a R^2 of 0.48. The F-Statistic, with 2 and 29 degrees of freedom, is 13.3965. This exceeds 3.3277, the critical value of F-Statistic with 2 and 29 degrees of freedom at 0.05 level of significance.

Of the two significant variables in the model, the more significant variable is dividend cover, with a regression coefficient of -0.51164, significant at the 0.001 level. The other significant level is asset mix, with a coefficient of -0.04439, at a significance level of 0.025.

TABLE A-13 Explanatory Model for Kowloon Stock Exchange

Variable Name	Regression Coefficient	T-Statistic	Significance Level
Asset Mix (log)	-0.04439	2.38	0.025
Dividend Cover (log)	-0.51164	4.18	0.001

Residual Error	0.07699
Multiple Correlation (R)	0.693
R^2	0.48
Intercept Term (α)	1.02908
Degrees of Freedom	29
Critical Value of T-Statistic with 29 d.f. at 0.05 level of significance	2.0452
F-Statistic with 2 $d.f._1$ and 29 $d.f._2$	13.3965
Critical Value of F-Statistic with 2 $d.f._1$ and 29 $d.f._2$ at 0.05 level of significance	3.3277

Variables not in the Regression Set	T-Statistic
Net Asset per Share (log)	0.16
Total Assets (log)	0.01

EXHIBITS

A. Letter of Application signed by a member of the Exchange.

B. Four copies of the Prospectus with one copy dated and signed by every person who is named therein as a Director.

C. A copy of Advertisement in a newspaper of the new issue, with an abridged announcement in other newspapers.

D. Photostat copies of the Certificate of Incorporating of the Company.

E. A specimen of the Memorandum and Articles of Association.

F.(i) The general undertaking in the form set out in Rules and Regulations Governing the Official Listings of Securities.

(ii) A certified copy of resolutions of the Board of Directors to the effect:-

(1) In compliance with the listing requirements of the Committee of the stock exchanges it was resolved that the Company shall not act as stock or share brokers or dealers in securities and shall exercise all voting and other rights or powers of control exercisable by the Company in relation to its subsidiary companies for the time being so as to secure (so far as by such exercise the Company can secure) that no such subsidiary shall act in manner aforesaid;

(2) Authorising the issue of all securities for which quotation is sought and subsequently allotting the same; and

(3) Approving and authorising the issue of the Prospectus.

G A certified copy of every (i) Report, (ii) Balance Sheet, (iii) Valuation, (iv) Contract, (v) Resolution or other documents any part of which is extracted or referred to in the Prospectus.

H. A certified copy of the written consent by experts to the inclusion in the Prospectus of

(i) The Reporting Accountants for the Accountants' Report;

(ii) Professional Valuer for the Valuation Report.

I. Temporary Document of Title in respect of 3,750,000 shares.

J. A specimen of Share Certificate.

K. A statement in the form set out in Rules and Regulations Governing the Official Listings of Securities, which includes and undertakes to submit the declaration set out in Rules and Regulations Governing the Official Listings of Securities.

Procedures of Listing

Day 1 Board of Directors Meeting

(i) Approve notice to shareholders for Annual General Meeting to be held on Day 22.

(ii) Approve notice to shareholders for Extraordinary General Meeting to approve increase of Authorized Capital and share split into lower par value.

Day 21 Board of Directors Meeting

(i) Approve notice of Extraordinary General Meeting on Day 42 to shareholders to adopt new Articles of Association and by Special Resolution to convert Company from Private Company into a Public Company.

(ii) Approve transfer of shares by existing shareholders.

(iii) Open Bank Account for the new issue in a Hong Kong commercial bank.

Day 22 1. Annual General Meeting

(i) Adopt new accounting period.

(ii) Appoint new Directors.

(iii) Appoint Company Auditor.

(iv) Fix Directors' fees.

2. Extraordinary General Meeting

(i) By an Ordinary Resolution the Company increases its Authorized Capital.

(ii) By an Ordinary Resolution, shares were split to lower par value.

Day 28 (i) Filing of annual return to Company Registry.

(ii) Filing of increase of Authorized Capital and Capital Split to Company Registry.

Day 20 Directors Meeting

(i) Minute acquisition of proposed properties.

(ii) Enter into Agreement on proposed acquisition.

(iii) Deposit paid on agreement.

(iv) Approve allotment of shares for new subscribers.

(v) Directors' Undertaking not involve in brokering.

(vi) Prospectus Draft Date - Day 44 approved new issue of shares.

(vii) Authorise the Company stock broker as agent for Company to apply to Stock Exchange for quotation.

Day 35 Return of Allotment of shares to Company Registry.

Day 42 Extraordinary General Meeting convert to Public Company and adopt new Articles of Association.

Special Resolution converting the Company from a Private Company into a Public Company.

Board of Directors Meeting - Approving the following documents:-

(i) Declaration by Director and Secretary.

(ii) Letter to Exchange to apply for listing by Member and by Company.

(iii) Undertaking to Stock Exchange.

(iv) Application of Shares.

(v) Underwriting Agreement.

(vi) Letter from Bank and confirmed by Company.

Day 44 Board Meeting - Approve the following documents :-

A. (1) Prospectus.

(2) Accountants' Report by Company Accountants.

(3) Company Accountants' consent to publish report in Prospectus.

(4) Valuation Report by Professional Valuer.

(5) Consent by Professional Valuer to publish report in Prospectus.

(6) Share Registrar's Consent to include Share Registrar's name in Prospectus.

(7) Letter of Underwriting from Underwriter.

(8) Undertaking to Stock Exchange for Quotation.

(9) Profit forecast for two coming years 30/9/1973 to 30/9/1974.

(10) Share Certificate specimen.

B. Directors certify prospectus.

Confirm forecast of current position and prospects in Prospectus :-

(1) Signed Prospectus.

(2) Delivery of Documents to Company Registrar for Registration.

(3) Prospectus be printed, distributed and advertised.

(4) Appoint Share Registrar and Transfer Office.

(5) Apply to Stock Exchange for listing.

(6) Authorize directors, sign and seal General Undertaking to Stock Exchange.

(7) Underwriting Agreement by Underwriter be executed.

(8) Share Certificate specimen be adopted.

(9) Registrar be authorized to affix common seal to all certificates.

Day 55 Distribution of Application Forms and Prospectuses of the New Issue through the Stock Exchange or receiving banks in the case of a public issue.

Day 62 Closing date for Application.
Clearing of all cheques and processing of Application.

Day 63 A lottery be held to allot shares to applicants if necessary and preparation of Share Certificates.

Day 67 Distribution of Share Certificates to applicants.

Day 69 Letter to the Stock Exchange confirming delivery of Share Certificates before trading can commence.

Day 70 Trading begins on the floor.

An Example of a Profit Forecast

	Year Ending 1973	Year Ending 1974
Receipts from Rent	$ 671,792	$ 725,535
Less - Repair & Maintenance	$ 35,000	$ 40,000
	$ 636,792	$ 685,535
Less - Depreciation on Building (3%)	$ 120,000	$ 120,000
	$ 516,792	$ 565,535
Add - Development Profit	$1,100,000	---
Dividend from Subsidiary	$ 340,000	$1,650,000
	$1,956,792	$2,215,535
Add - Interest Income	$ 33,589	$ 36,776
	$1,990,381	$2,252,311
Less - Administrative Expense	$ 150,000	$ 150,000
	$1,840,381	$2,102,311
Less - 15% Corporate Tax	$ 276,057	$ 315,346
N E T P R O F I T	$1,564,324	$1,786,965
Less - Reserve	$ 364,324	$ 586,965
	$1,200,000	$1,200,000
Less - Dividend	$1,200,000	$1,200,000
	Nil	Nil
Dividend	8¢	9¢
Yeild	8%	9%
Dividend Cover	1.30	1.32
P/E Ratio	9.6 times	8.4 times

Company Balance Sheet

FIXED ASSETS		
Land and Building, at cost		$ 9,000,000
CURRENT ASSETS		
Land at cost	$ 1,465,000	
Building work in progress	2,094,169	
Deposit for purchase of shares of Charade Investment Co. Ltd. (Owner of N.K.I.L.5412)	$ 1,000,000	
Cash in hand and at bank	926,138	
Time deposits	69,150	$ 5,554,457
		$14,554,457
Less: CURRENT LIABILITIES		
Account Payable	$ 2,174	
Bank Loan (Secured)	700,000	
Customers' deposits	2,604,006	3,306,180
N E T T A N G I B L E A S S E T S		$11,248,277

An Illustration of

Profit Estimate on a Proposed Building Site

Proposed Building	9 storey over car park
Site Area	16,510 sq. ft. coverage 36% Plot Ratio 3.24
Gross Floor Area	5,943.6 sq. ft. x 9 storey = 53,492 sq.ft.

1. Estimated Cost of Construction

Land 16,510 sq.ft. @ $339.18 per sq.ft.	= $ 5,600,000
Site Formation	= $ 100,000
Piling and Foundation	= $ 250,000
Construction 5,943 sq.ft. x 90 ft. @ $4.50	= $ 2,400,000
Lift 10 persons @ $90,000 x 2	= $ 180,000
Architect's fee	= $ 90,000
Miscellaneous Expenses	= $ 80,000
TOTAL COST	$ 8,700,000
COST OF LAND	$ 2,201,000
	$10,901,000

2. Proceeds of Sale

Residential 6 units per floor of area

5,400 sq.ft. @ $220 per sq.ft.	= $10,690,000

Car Park

Covered @ $15,000 each x 23	= $ 345,000
Space @ $10,000 each x 36	= $ 360,000
TOTAL REVENUE	$11,395,000

3. Gross Profit

Total Revenue	$11,395,000
Total Cost	$ 8,700,000
	$ 2,695,000
Less :- Tax	$ 404,250
N E T P R O F I T	$ 2,290,750

EXHIBIT D-2

An Illustration of

Profit Estimate on a Proposed Building Site

Proposed Building - 25 storey building

Site Area - 3,654 sq.ft. coverage 37.5%

1. Estimated Cost of Construction

Land 3,654 sq.ft. @ $399.56 per sq.ft.	= $	1,460,000
Stamp-duty	= $	30,000
Commission	= $	15,000
Site Formation	= $	10,000
Piling and Formation	= $	200,000
Construction Cost	= $	1,567,000
Lift:- 8 persons of 3 lifts	= $	232,000
Architect's fee @ 3%	= $	45,000
Miscellaneous Expenses	= $	15,000
T O T A L C O S T	$	3,574,000

2. Proceeds of Sales

Commercial

G/F @	(Unit A = 1080 sq.ft.x $287=$310,000 (Unit B = 1672 sq.ft.x $287=$480,000 (Unit C = 905 sq.ft. x $287=$260,000	= $	1,050,000
1/F	2,966 sq.ft. @ $182.00	= $	540,000

Residential

$74,000/80,000 per flat x 46	= $	3,745,000
	$	5,335,000
Less 10 % discount	$	533,500
T O T A L R E V E N U E	$	4,801,500

3. Gross Profit

Total Revenue	= $ 4,801,500
Total Cost	= $ 3,574,000
Development Profit before Tax	= $ 1,227,500
Less :- 15% Tax	= $ 184,125
N E T P R O F I T	$ 1,043,375

BIBLIOGRAPHY

BIBLIOGRAPHY

This bibliography is confined to the reference materials referred to in the footnotes of each chapter.

(1) Official Reports, Documents and Other Publications

Admission of Securities to Quotation, Hong Kong Stock Exchange Ltd., July, 1975.

Articles of Association, Far East Exchange Ltd.,1973, Nos.2-3.

Far East Economic Review, "New Hong Kong Record", 15th January, 1973.

Hong Kong Government Gazette, "Securities Ordinance 1974", 22nd February,1974.

Hong Kong Monthly Digest of Statistics, November, 1974.

Requirements for Quotations, Kowloon Stock Exchange Ltd.,1976.

Rules and Regulations Governing the Official Listings of Securities, Far East Exchange Ltd., 1971.

Rules and Regulations Governing the O-ficial Listings of Securities, Kam Ngan Stock Exchange Ltd., 1976.

Speech by Hon. Philip Haddon-Cave, Financial Secretary, in Legislative Council, Wednesday, 12th December 1973, HANSARD.

(2) Books

Arditti, F., "Risk and the Required Return on Equity", Journal of Finance, March 1967.

Barlow, L.E., "Earnings Ratios in Valuing Companies", The Canadian Chartered Accountant, Vol. 75, No. 4, October, 1959.

Bauman, W.S.,"Scientific Investment Analysis", Financial Analysts Journal, 1967, p.93-97.

Baumol, W.J., The Stock Market and Economic Efficiency, Fordham University Press, New York, 1965.

Beech, J.W., "Public Financing for Small Companies", The Canadian Chartered Accountant, Vol. 85, No. 6, December 1964.

Benishay, H., "Variability in Earnings - Price Ratios of Corporate Equities", American Economic Review, 1961.

Bischoff, W.F.W., "A Revolution Gains Momentum", Far Eastern Economic Review, April 9, 1973.

....., "Merchant Banking - The Concept Matures", Far Eastern Economic Review, April 1, 1972.

Clarkson, G.P.E., Portfolio Selection : A Simulation of Trust Investment, Prentice Hall, 1962, p.28.

Collins, N., "The Management Malaise", Going Public 1973, Haymarket Publishing Ltd., London, 1973.

Corbett, G., "How Independent is Independent?" Going Public 1972, Haymarket Publishing Ltd., London, 1972.

Davis, E.W. & Yeomans, K.A., Company Finance and the Capital Market, Department of Applied Economics Occasional Paper 39, University of Cambridge, 1974.

....., Observations on Equity Price Discounts in the London New Issue Market, The University of Aston, 1975.

Durand, D., "Bank Stock Prices and the Analysis of Covariance", Econometrica, January, 1955.

Gordon, M.J., The Investment, Financing and Valuation of the Corporation, R.D. Irwin, Homewood, III, 1962.

Henderson, R.F., The New Issue Market and the Finance of Industry, Cambridge, Bowes & Bowes, 1951.

Hoffman, P.J., The Paramorphic Representation of Clinical Judgement, Psychological Bulletin, March 1960, p.119-121.

Jaffrey, P., "Raising Capital Funds", The Canadian Chartered Accountant, Vol. 90, No. 2, February 1967.

Keenan, M., "Models of Equity Valuation : The Great SERM Bubble", Journal of Finance, 1970.

Lerner, E.M. & Carleton, W.T., "The Integration of Capital Budgeting and Stock Valuation", American Economic Review, September, 1964.

Logue, D.E. & Lindvall, J.R., "The Behavior of Investment Bankers : An Econometric Investigation", Journal of Finance, March 1974.

Magee, J., Technical Analysis of Stock Trends, John Magee, Springfield, Mass.,1973, 5th ed.

Mason, S., "Merchant Banking Today and in the Future", Journal of Business Finance, Vol. 3, No. 4, 1971.

McDonald, J.G. & Fisher, A.K., "New-Issue Stock Price Behavior", Journal of Finance, March 1972.

Merrett, A.J., Howe, M., Newbould, G.D., Equity Issues and the London Capital Market, Longmans, London, 1967.

Newbould, G.D., "On the Prediction of New Issue Prices", Journal of Economics Studies, Summer, 1966.

Pearson, E.S. & Hastley, H.O., Biometrika Tables for Statisticans, Vol. II, Cambridge University Press, 1972, p.117-118.

Roberts, P.J., Valuation of Development Land in Hong Kong, Hong Kong University Press, 1975.

Slovic, P.,"Analyzing the Expert Judge : A Descriptive Study of a Stockbroker's Decision Process",Journal of Applied Psychology, Vol. 53, No. 4, August 1969, p.255.

....., Fleissner, D., & Bauman, W.S., "Analyzing the Use of Information in Investment Decision Making : A Methodological Proposal", Journal of Business, Vol. 45, No.2, April 1972, p.285.

.....,"Psychological Study of Human Judgement : Implications for Investment Decision Making", Journal of Finance, Vol. 27, No. 4, September, 1972, p.780.

Stansbury, C.B., The Dow Theory Explained, Richard Russel Associates, New York, 1960, p.16.

Sir Timothy Harford, "Pricing a Floatation", Journal of Business Finance, Vol. 1., No. 1, 1969.

Tinbergen, J., "The Dynamics of Share Price Formation", Review of Economics and Statistics, 1938.

Vaughan, G.D., Grinyer, P.H., & Birley, S.J., From Private to Public, Woodhead-Faulkner, 1977.

Watt, T., "The Accountant's Report", Going Public 1971, Haymarket Publishing Ltd., London, 1971.

Wong, K.A., The Stock Market in Hong Kong, University of Liverpool, 1975.

Standard Errors of the Prediction and Explanatory Models

Wardley

Prediction Model:

$$\log P/E_i = 0.79253 - 0.05197 \log ASMIX + 0.07420 \log TASS - 0.50739 \log DCOV - 0.46478 \log INT$$

(0.330584) (0.0161399) (0.0296728) (0.233501) (0.20955)

Explanatory Model:

$$\log P/E_i = 0.42250 - 0.04764 \log ASMIX + 0.07441 \log TASS - 0.49597 \log DCOV + 0.04796 VOLAT$$

(0.160076) (0.0136919) (0.0200775) (0.176421) (0.0177763)

Jardine Fleming

Prediction Model:

$$\log P/E_i = -0.22024 - 0.08206 \log ASMIX + 0.14992 \log TASS$$

(0.223148) (0.0317294) (0.0291019)

Explanatory Model:

$$\log P/E_i = -0.17595 - 0.05873 \log ASMIX + 0.14524 \log TASS$$

(0.210274) (0.0273191) (0.0273682)

Standard Errors of the Prediction and Explanatory Models(Cont'd.)

Schroders & Chartered

Prediction Model:

$$\log P/E_i = -0.02047 + 0.17658 \log NASPS + 0.10796 \log TASS + 0.12884 VOLAT$$

(0.305065) (0.05170) (0.040880) (0.0402789)

Explanatory Model:

$$\log P/E_i = 0.13325 + 0.09820 \log TASS + 0.11240 VOLAT$$

(0.281000) (0.0375296) (0.0464526)

Hang Seng Bank

Prediction Model:

$$\log P/E_i = 0.18312 - 0.08455 \log ASMIX + 0.09949 \log TASS$$

(0.186677) (0.02949) (0.238835)

Explanatory Model:

$$\log P/E_i = 0.18534 - 0.05597 \log ASMIX + 0.10323 \log TASS - 0.62759 \log DCOV + 0.05318 TREND$$

(0.171098) (0.0217699) (0.0196316) (0.274444) (0.0214652)

Oriental Financial Consultants

Prediction Model:

$$\log P/E_i = 0.30029 + 0.12381 \log TASS - 1.32825 \log DCOV$$

(0.402562) (0.056844) (0.1733)

Explanatory Model:

$$\log P/E_i = 1.17165 - 1.35173 \log DCOV$$

(0.0210217) (0.173248)

Standard Errors of the Prediction and Explanatory Models (Cont'd.)

Union Bank

Prediction Model: (Land only)

$\log P/E_i = 1.09218 - 1.04449 \log DCOV$

(0.0100829) (0.0870512)

Explanatory Model: (Land only)

$\log P/E_i = 1.06437 - 0.01376 \log ASMIX - 0.92698 \log DCOV$

(0.0129067) (0.00602096) (0.0846201)

Hang Lung Bank

Prediction Model:

$\log P/E_i = 1.18772 - 1.71283 \log DCOV$

(0.0251363) (0.29548)

Explanatory Model:

$\log P/E_i = 1.11730 - 1.23497 \log DCOV$

(0.0396395) (0.412818)

Overseas Trust Bank

Prediction Model:

$\log P/E_i = 1.08611 - 1.02023 \log DCOV$

(0.0429209) (0.317003)

Explanatory Model: (Land only)

$\log P/E_i = 1.08103 - 1.06401 \log DCOV$

(0.0215442) (0.176767)

Standard Errors of the Prediction and Explanatory Models (Cont'd.)

Bangkok Bank

Prediction Model: (Land only)

$$\log P/E_i = 1.22892 - 1.67127 \log DCOV$$

(0.0741451) (0.587844)

Explanatory Model: (Land only)

$$\log P/E_i = 1.23044 - 1.68092 \log DCOV$$

(0.0684848) (0.594114)

Far East Exchange

Prediction Model:

$$\log P/E_i = 1.10905 + 0.05064 \log TASS - 1.28668 \log DCOV - 0.51021 \log INT$$

(0.224006) (0.0157706) (0.139154) (0.246372)

Explanatory Model:

$$\log P/E_i = 0.68910 + 0.05865 \log TASS - 1.26503 \log DCOV$$

(0.099324) (0.0129888) (0.127242)

Kam Ngan Stock Exchange

Prediction Model:

$$\log P/E_i = 0.71896 + 0.05607 \log TASS - 1.28633 \log DCOV$$

(0.122776) (0.0161815) (0.166322)

Explanatory Model:

$$\log P/E_i = 0.80561 + 0.10474 \log NASPS + 0.04254 \log TASS - 1.22507 \log DCOV$$

(0.111414) (0.0392459) (0.0148606) (0.143229)

Standard Errors of the Prediction and Explanatory Models (Cont'd.)

Hong Kong Stock Exchange

Prediction Model:

$$\log P/E_i = 0.00537 - 0.05356 \log ASMIX + 0.12526 \log TASS$$
$$(0.194511) \quad (0.0206185) \quad (0.0252436)$$

Explanatory Model:

$$\log P/E_i = 0.39405 - 0.04288 \log ASMIX + 0.10763 \log TASS - 0.32863 \log INT$$
$$(0.209009) \quad (0.0167865) \quad (0.0213934) \quad (0.151657)$$

Kowloon Stock Exchange

Prediction Model:

$$\log P/E_i = 0.99828 - 0.05859 \log ASMIX - 0.40091 \log DCOV$$
$$(0.0347060) \quad (0.0214078) \quad (0.128853)$$

Explanatory Model:

$$\log P/E_i = 1.02908 - 0.04439 \log ASMIX - 0.51164 \log DCOV$$
$$(0.028488) \quad (0.0186266) \quad (0.122508)$$